THE IRON AGE

A Review of the Hardware, Iron, Mac... ...l Trades.

Published every Thursday Morning by David Williams Co., 232-238 ...illiam St., New York.

Vol. 67: No. 20 — New York, Thursday, May 16, 1901. — $5.00 a Year, including Postage. Single Copies, Ten Cents.

Smithsonian Institute 02* Washington D.C.

Reading Matter Contents.....	page	62
Alphabetical Index to Advertisers	"	153
Classified List of Advertisers.....	"	155
Advertising and Subscription Rates	"	73

IRON AND STEEL

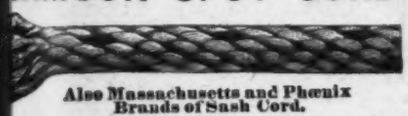
REPUBLIC IRON & STEEL COMPANY

CHICAGO, ILL.

PRODUCTS

THE BRISTOL COMPANY,
Waterbury, Conn.
Bristol's Recording Instruments.
For Pressure Temperature and Electricity.
Silver Medal, Paris Exposition.
All Ranges, Low Prices, and Guaranteed. Send for Circulars.

SAMSON SPOT CORD



Also Massachusetts and Phœnix Brands of Sash Cord.

SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES.

Branch Office, 11 Broadway, New York.
Cleveland City Forge and Iron Co., - Cleveland, O.

TURNBUCKLES.

MERRILL BROS.,
465 to 471 Kent Ave.,
Brooklyn, E.D., N.Y.

BESSEMER PIG.

PILLING & CRANE, Girard Building, Phila. Lewis Block, Pittsburgh 56 Pine St., New York.

American Sheet Steel Company
Battery Park Building
New York
Manufacturers of all varieties of
Iron and Steel Sheets
Black and Galvanized
Plain and Painted
Flat, Corrugated and
"V" Crimped

Apollo Best Bloom Galvanized Sheets
W. Dewees Wood Company's
Planished Iron
W. Dewees Wood Company's
Refined Iron
Wellsville Polished Steel Sheets

A New U. M. C. .22 Short Smokeless Cartridge

AT A REDUCED PRICE.

ACCURATE,

SMOKELESS,

CLEAN.

Little Noise.

No burning grains of powder from the rifle's muzzle.

Comparatively Cheap.

Your Dealer has it or can get it for you.
Send for Illustrated Folder Describing the New .22 Short.

THE UNION METALLIC CARTRIDGE CO.,
315 BROADWAY, N. Y. BRIDGEPORT, CONN.

CAHALL BOILERS See Page 108

CAPEWELL HORSE NAILS.

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, ST. LOUIS, BOSTON, DETROIT, CINCINNATI, SAN FRANCISCO, PORTLAND, ORE., BUFFALO, BALTIMORE, NEW ORLEANS.

LIBRARY OF CONGRESS MAY 17 1901 SMITHSONIAN DEPOSIT

THE CAPEWELL HORSE NAIL COMPANY,
HARTFORD, CONN.

Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the *BEST* ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

Brass Prices High, So Use Bright "Swedoh" Stamping Steel. Easily Brass Plated and Save Money. See page 142

MAGNOLIA METAL.

Best Anti-Friction Metal for all Machinery Bearings.

Fac-Simile of Bar. Beware of Imitations.

MAGNOLIA METAL CO., Owners and Sole Manufacturers, 266 and 267 West St., NEW YORK. London, Chicago, Montreal, Pittsburgh, Boston, San Francisco, Philadelphia.

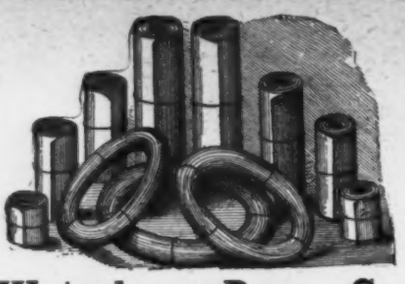
THE
ANSONIA BRASS AND COPPER CO.
MANUFACTURERS OF
BRASS AND COPPER
Seamless Tubes, Sheets, Rods and Wire.

Ingot Copper.

SOLE MANUFACTURERS
Tobin Bronze
(TRADE-MARK REGISTERED.)
Condenser, Plates, Pump Linings, Round, Square and Hexagon Bars, for Pump Piston Rods and Bolt Forgings.

99 John Street, - - New York.

Randolph-Clowes Co.,
Main Office and Mill,
WATERBURY, CONN.
MANUFACTURERS OF
SHEET BRASS & COPPER.
BRAZED BRASS & COPPER TUBES.
SEAMLESS BRASS & COPPER TUBES
TO 36 IN. DIAM.
New York Office, 253 Broadway, Postal Telegraph Bldg., Room 202.
Chicago Office, 602 Fisher Bldg.
Boston Office, Cor. Oliver and Purchase Sts.



Waterbury Brass Co.
Established 1845.
Sheet, Roll and Platers' Brass,
German Silver, Copper, Brass and German Silver Wire, Brass and Copper Tubing.
COPPER RIVETS AND BURS.
TAPE MEASURES,
METALLIC EYELETS,
Brass Kettles, Brass Tags, Powder Flasks, Shot Pouches, &c.,
AND SMALL BRASS WARES OF EVERY DESCRIPTION
Cartridge Metal in Sheets or Shells a Specialty.
DEPOTS:
60 Centre St., New York. 125 Eddy St., Providence, R. I. 38 Mechanic St., Newark, N. J.
MILLS AT WATERBURY, CONN.

Deoxidized Bronze
Best Acid-Resisting Metal in the United States . . .
Send for Price.
Bridgeport Deoxidized Bronze & Metal Co.,
BRIDGEPORT, CONN.

THE PLUME & ATWOOD MFG. CO.,
MANUFACTURERS OF
Sheet and Roll Brass
—AND—
WIRE
PRINTERS' BRASS, JEWELERS' METAL, GERMAN SILVER AND GILDING METAL, COPPER RIVETS AND BURRS.
Pins, Brass Butt Hinges, Jack Chain, Kerosene Burners, Lamps, Lamp Trimmings, &c.
29 MURRAY ST., NEW YORK.
144 HIGH ST., BOSTON.
199 LAKE ST., CHICAGO.
ROLLING MILL: THOMASTON, CONN. | FACTORIES: WATERBURY, CONN.

SCOVILL MFG. CO.,
Manufacturers of
BRASS
SHEET, WIRE, TUBES.
Hinges, Buttons, Lamp Goods, Nipples, Pumps and Oilers for Bicycles, Braziers' Solder.
FACTORIES, WATERBURY, CONN.
DEPOTS:
NEW YORK, CHICAGO, BOSTON.

JOHN DAVOL & SONS,
AGENTS FOR
Brooklyn Brass & Copper Co.,
DEALERS IN
COPPER, TIN, SPELTER, LEAD, ANTIMONY.
100 John Street, - New York.

Matthiessen & Hegeler Zinc Co.,
LA SALLE, ILLINOIS.
SMELTERS OF SPELTER
AND MANUFACTURERS OF
SHEET ZINC AND SULPHURIC ACID.
Special Sizes of Zinc cut to order. Rolled Battery Plates.
Selected Plates for Etchers' and Lithographers' use.
Selected Sheets for Paper and Card Makers' use.
Stove and Washboard Blanks.
ZINCS FOR LECLANCHE BATTERY.

Arthur T. Rutter,
SUCCESSOR TO
WILLIAM S. FEARING,
256 Broadway, New York.
Sheet Brass, German Silver, Copper, Brass and German Silver Wire, Brazed and Seamless Brass and Copper Tubes, Small Tubing a Specialty. Brass and Copper Rods, Brass Ferrules. Sheet and Ingot Copper; Spelter, Tin, Antimony, Lead, etc.

BRASS FOUNDERS FINISHERS J. J. RYAN & CO.
8874 West Monroe St., Chicago.
Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS On Short Notice.

No better counter made.
4 Wheel, $3.00
5 Wheel, $3.25
Guaranteed.
R. A. HART, BATTLE CREEK, MICH

MEGAPHONES
DISCOUNT TO HARDWARE DEALERS.
Crane Bros., - Linenoid Mfrs., - Westfield, Mass.
SEND FOR CATALOGUE.

"PHONO-ELECTRIC" WIRE. "IT'S TOUGH."

TROLLEY, TELEPHONE and TELEGRAPH LINES.
Mills, Bridgeport, Conn. BRIDGEPORT BRASS CO., 19 Murray St., New York.

HENDRICKS BROTHERS
PROPRIETORS OF THE
Belleville Copper Rolling Mills,
MANUFACTURERS OF
Braziers' Bolt and Sheathing
COPPER,
COPPER WIRE AND RIVETS.
Importers and Dealers in
Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.
49 CLIFF ST., NEW YORK.

BRASS AND IRON GEARS, IN STOCK WITH CUT OR CAST TEETH.
SPECIAL WORK TO ORDER. SEND FOR OUR 1895 PRICE LIST.
T. F. WELCH MFG. CO., 62 SUDBURY STREET, BOSTON.

THE IRON AGE

THURSDAY, MAY 16, 1901.

Turret Machine with Large Spindle Capacity.

BY C. L. GOODRICH, HARTFORD, CONN.

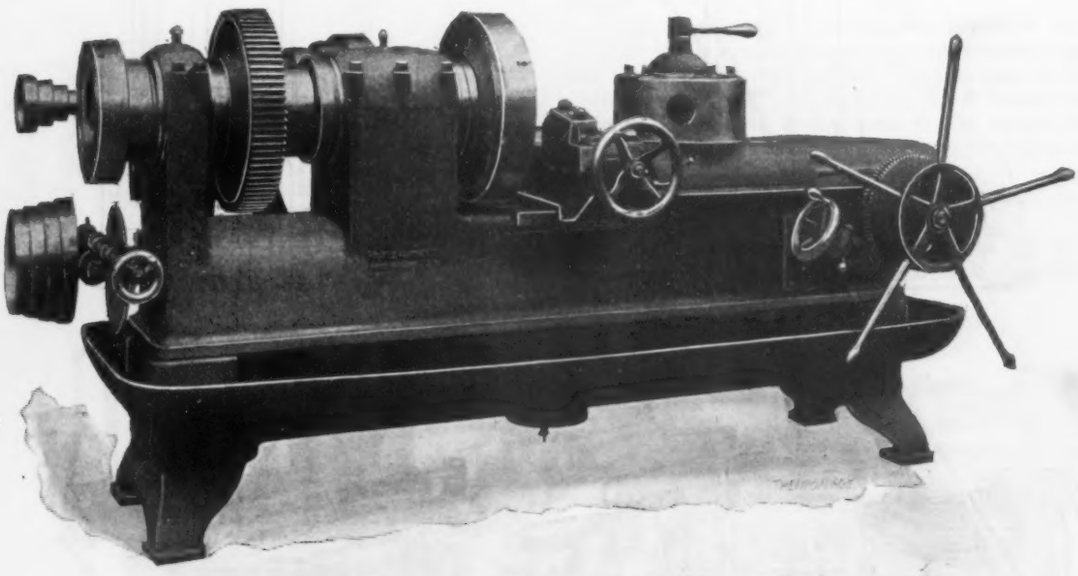
With the advent of motor vehicles the demand for a turret machine of large spindle capacity for use in economically machining pieces from the bar or tubing for piston packings, valve rings, bearings, &c., has asserted itself, and we are pleased to bring to the attention of our readers a most excellent tool for handling work of the above description up to 7½ inches in diameter.

As will be seen by Fig. 1, the head and bed are cast in one piece, insuring great rigidity. The turret slide is gibbed to and slides directly on the bed, which makes the slide very stiff at any position of its travel. There is adjustment so that the turret slide may be operated between any desired points on the bed, thus making it

One of the most objectionable features to a lathe of this type as regards the feed of the turret slide has been well taken care of by use of a frictional drive which allows of any feed from 0.008 inch to 0.1 inch per revolution of spindle being quickly obtained. Figs. 5 and 6 will give the reader a clear idea of this.

The position of the roll which controls the speed of the turret slide feed shaft can be readily adjusted in and out by the small hand wheel shown at the left of the bed in Fig. 1. Suitable gauging stops are provided so that several rates of feed may be quickly obtained, the changing from slowest to fastest feed taking but a few seconds.

The forming or cutting off fixture, Fig. 2, consists of two separate slides, which are fed by means of a right and left hand screw so that both may, when it is so desired, be used simultaneously for forming or cutting off. It will be noticed that tool blocks are fastened to



TURRET MACHINE WITH LARGE SPINDLE CAPACITY.

highly efficient and doing away with a great deal of unnecessary travel heretofore found in turret machines.

The adjustment for locating the travel of the slide is very simply effected by the use of an adjustable bar in the bed of the machine, against which the turret indexing apparatus comes in contact with the backward movement of the turret slide.

The head spindle is powerfully back-geared, Fig. 5, and driven by a five-grade cone. The spindle is of cast iron and runs in cast iron bearings. In this connection it might be stated that no better wearing surfaces than cast iron upon cast iron can be desired, providing care is taken to properly fit the two surfaces, and ample provision made for oiling. As might be expected of a machine originally brought out for automobile work, ball bearings are freely used. The spindle thrust is taken against separated ball bearings—*i. e.*, the balls are held in a cage which prevents their rubbing or grinding against each other.

The writer has personally seen the wisdom of thus separating balls in high speed grinding machinery, where as high a spindle speed as 26,000 revolutions per minute has been obtained with unappreciable heating—and under the same conditions by removing the cage and using more balls one-half this speed was impractical for any satisfactory length of time.

the slide so that by the substitution of different blocks a large variety of work can be taken care of. The right and left hand screw is driven by worm and worm gear and is provided with an adjustable automatic knock-off. Provision is also made for hand feed.

The turret slide likewise has both hand and automatic feed. For light hand work the spider wheel is used, but for operations requiring a slow, powerful hand feed a worm may be engaged with worm gear on the spider shaft and the turret slide fed through the same by the hand wheel, conveniently located, as shown at the right in Fig. 1. For steel work oiling attachments for lubricating the turret tool through the turret and overhead are supplied, and allow higher speeds and feeds, insuring greater longevity to tools, and resulting in increased productions. One of the pieces, Fig. 4, which the writer saw turned out on one of the turret lathes was made from tubing high enough in carbon to harden in an open fire. The tools used are shown in the turret of the machine, Fig. 3.

The several operations are as follows: The tube is first moved forward to the stop gauge in the turret (the turret, of course, being against its stop), and the chuck jaws are tightened. The feed to the forming fixture is then thrown in and the turret revolved and the following tools used:

1. The heavy single pointed boring tool is advanced about ¾ inch to make a true running hole.

2. An inserted tooth step counter bore with teeth located at an angle to give a front rake, which curls the chip instead of tearing it off.

3. A solid taper reamer with left hand spiral flutes, each flute having a different angle so as to prevent chattering, finishes the hole. The left hand spiral reamer prevents the latter from drawing in and taking too heavy a chip.

On other work turned out on this machine where a taper hole of somewhat greater angle had to be finished a taper reamer having right hand spiral flutes was used with most exellent results. This reamer was controlled by the hand worm feed, which prevented a heavier chip being taken than advisable. The angle or taper was so

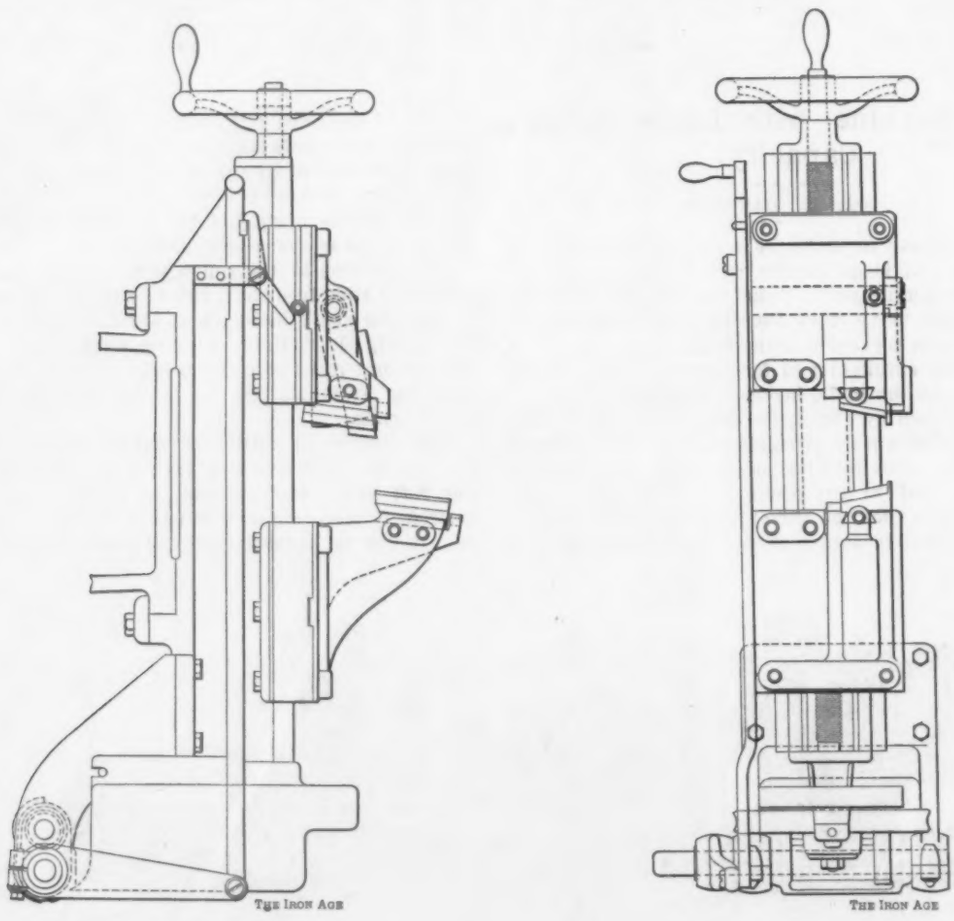


Fig. 2.—Forming or Cutting Off Slide.

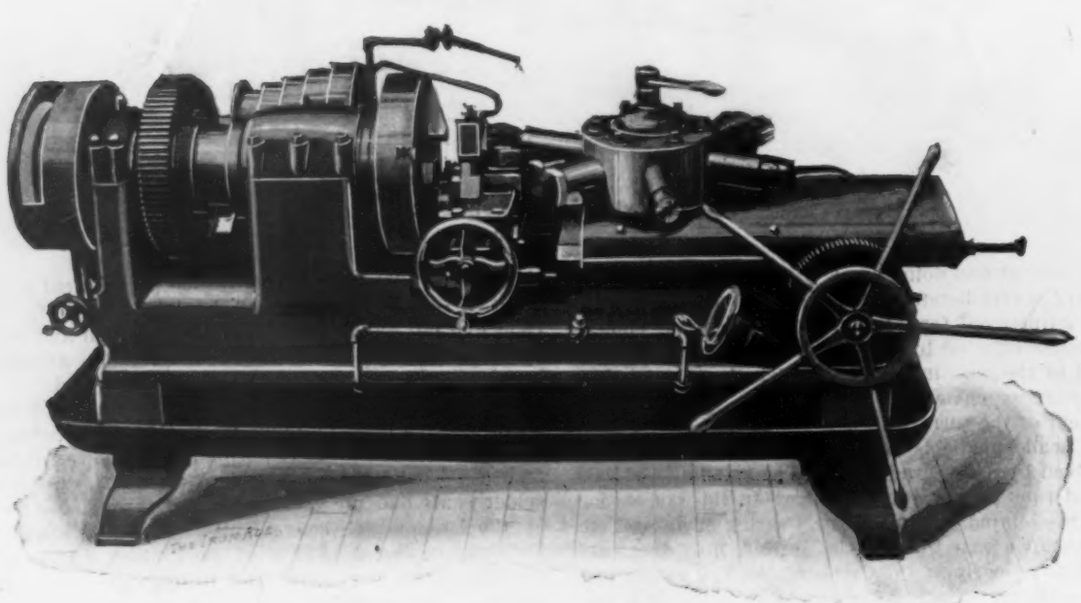


Fig. 3.—Front View of Machine Fitted with Spring Collet Mechanism for Head Spindle.

TURRET MACHINE WITH LARGE SPINDLE CAPACITY.

great that with an ordinary straight flute reamer very heavy pressure would have been necessary to have taken its cut. In this particular instance the reamer was really self feeding and restrained by the worm feed. This goes to prove that the smallest detail as regards the cut-

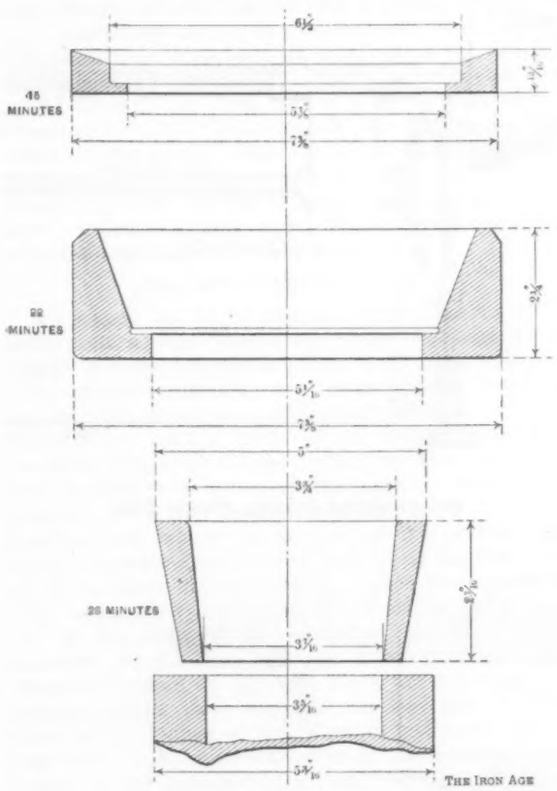


Fig. 4.—Work Done on Machine.

diameter that chucks will hold, 2¾ inches; length that can be milled, 10 inches; diameter of turret, 16 inches; distance of top of turret slide to center of turret hole, 4½ inches; distance from top of cut off slide to center of turret hole, 4½ inches; diameter of turret hole, 3½ inches; dimensions of spindle, front bearing, 9⅝ inches diameter, 14¼ inches long; number of grades on cone, 5; diameter of largest grade, 16 inches; width of belt, 3 inches; ratio of gearing, 11 to 1; floor space, 10 feet by 4 feet 6 inches; dimensions of counter shaft pulley, 4-inch face, 14 inches in diameter; revolutions of counter shaft per minute, 334; weight with counter shaft, about 7,000 pounds; weight boxed for export, about 9,000 pounds. Cubic feet of boxes, about 200.

The machine is manufactured by Pratt & Whitney Company of Hartford, Conn.

The Canadian Bounty Acts.

For some time past reports have been current to the effect that the Canadian acts relating to bounties on iron and steel might be construed as not applicable to exported material. We print below the acts in full, which show that such a construction is not justified:

Chapter 6, Acts of 1897, assented to June 29, 1897:

Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

1. The Governor in Council may authorize the payment of the following bounties on steel ingots, puddled iron bars and pig iron made in Canada—that is to say:

On steel ingots manufactured from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada, a bounty of $3 per ton;

On puddled iron bars, manufactured from pig iron made in Canada, a bounty of $3 per ton;

On pig iron manufactured from ore, a bounty of $3 per ton on the proportion produced from Canadian ore,

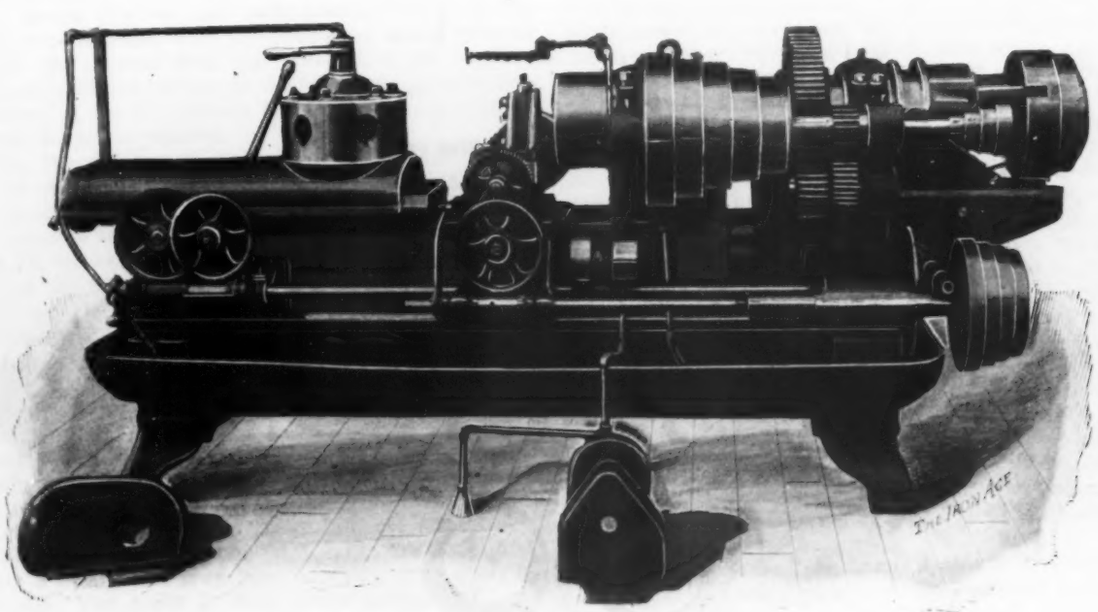


Fig. 5.—Rear View Fig. 3.

TURRET MACHINE WITH LARGE SPINDLE CAPACITY.

ting tools may result in condemning or commending a machine.

The chuck used on this heavy work was of the geared scroll type and proved to be very satisfactory for powerfully gripping the material.

Principal dimensions of the lathe are as follows:

Diameter of hole through spindle, 7¾ inches; largest diameter that chucks will hold, 7¾ inches; smallest

and $2 per ton on the proportion produced from foreign ore.

2. The said bounties shall be applicable only to steel ingots, puddled iron bars and pig iron made in Canada prior to the 23d day of April, 1902.

3. The Governor in Council may make regulations in relation to the said bounties in order to carry out the intention of this act.

4. Chapter 9 of the Statutes of 1894, entitled An Act to provide for the payment of bounties on iron and steel manufactured from Canadian ore, is hereby repealed.

Chapter 8, Acts of 1899, assented to August 11, 1899:

Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

1. The bounties on steel ingots, puddled iron bars and pig iron, made in Canada, authorized by Chapter 6 of the Statutes of 1897, shall, on the termination of the period therein mentioned, notwithstanding anything in the said chapter, continue to be applicable until the 30th day of June, 1907, and shall be payable and be gradually reduced, as follows:

a. From the 23d day of April, 1902, to the 30th day of June, 1903, both inclusive, the bounties shall be 90 per cent. of the amount fixed by said chapter;

b. From the 1st day of July, 1903, to the 30th day of June, 1904, both inclusive, the bounties shall be 75 per cent. of the amount fixed by said chapter;

c. From the 1st day of July, 1904, to the 30th day of June, 1905, both inclusive, the bounties shall be 55 per cent. of the amount fixed by said chapter;

d. From the 1st day of July, 1905, to the 30th day of June, 1906, both inclusive, the bounties shall be 35 per cent. of the amount fixed by said chapter;

e. From the 1st day of July, 1906, to the 30th day of June, 1907, both inclusive, the bounties shall be 20 per cent. of the amount fixed by said chapter.

2. Notwithstanding anything in the said Chapter 6, of the Statutes of 1897, or in this act, no bounty shall be paid under this act on steel ingots made from puddled iron bars manufactured in Canada.

3. The Governor in Council may make regulations in relation to the said bounties in order to carry out the intentions of this act.

The Sociedad Anonynia de Duro-Fulguera, Austurias, Spain, have lately been making large developments in their steel department. They have placed orders with the Wellman-Seaver Engineering Company, through their European representatives, Jeremiah Head & Son, for a 30-ton Wellman rolling open hearth furnace, a hydraulic ingot stripper, an electric ladle crane, an electric open hearth charging machine, and an electric bloom charging machine.

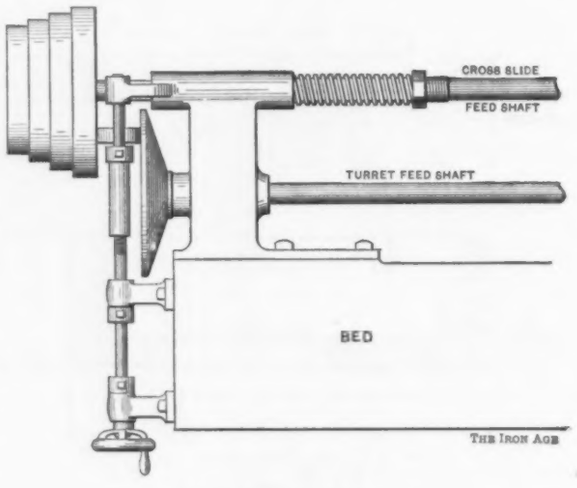


Fig. 6.—Sketch Showing Friction Drive.

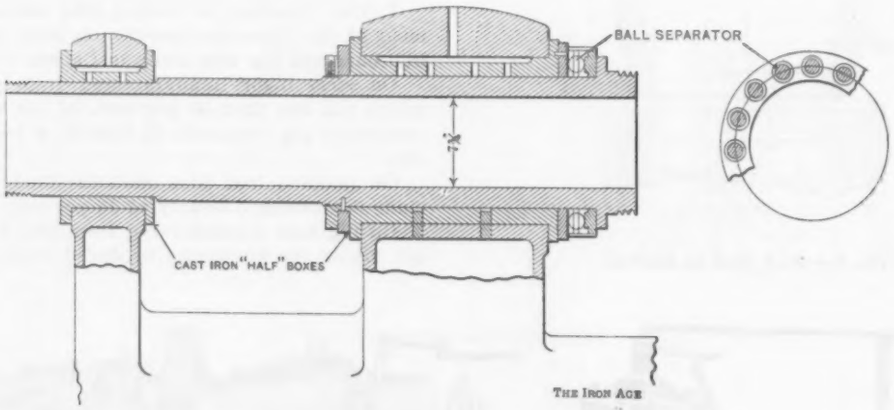


Fig. 7.—Section through Head Spindle.

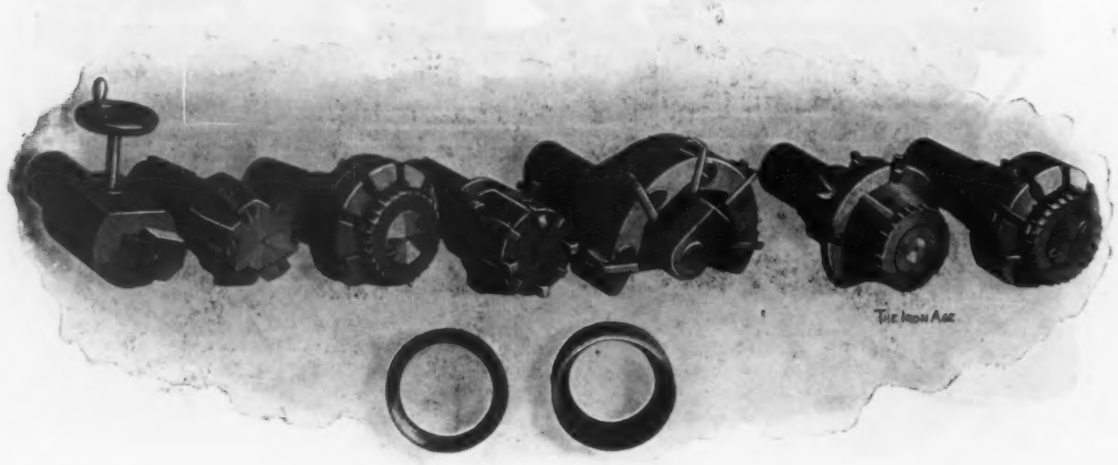


Fig. 8.—Some of the Turret Tools Used on the 7⅞-Inch Diameter Pieces.

TURRET MACHINE WITH LARGE SPINDLE CAPACITY.

Chilled Cast Iron Car Wheels at Present and in the Future.

BY WILLIAM FAWCETT, ST. CHARLES, MO.

The superintendents of motive power and other railroad officials who have given only a passing thought to the manufacture of chilled cast iron car wheels cannot comprehend the responsibility involved in the management of a car wheel foundry. There is no material used in car construction that has to pass through such a severe and critical inspection as the chilled cast iron wheel of the present day. Before freight car wheels are accepted or put into service each and every wheel is closely inspected, and has to meet the following requirements, which form only a part of a late wheel specification of a prominent railroad:

Car Wheel Specifications.

All wheels are to be inspected at the works of the maker; all wheels offered for inspection must be arranged in rows, all wheels of the same date of casting being grouped together; they must during inspection receive three blows with a 12-pound sledge at three different points on the inside of the flange between the brackets, and, after a close inspection, show no cracks and be free from every visible foundry defect. The physical test which wheels are subjected to consists in selecting two wheels at random by the railroad company's inspector from each 50 wheels, or fraction thereof, of the same date of casting. These two wheels are then subjected, at the option of the inspector, to either one or the other of the following tests for physical strength: In the drop test the wheel must be placed flange downward on an anvil block not less than 1700 pounds, having three supports not less than 5 inches wide, for the flange of the wheel to rest upon. In this position it must be struck centrally upon the hub by a weight of 140 pounds falling from the hight of 12 feet. The striking face of the weight must be flat, having a diameter of not less than 7 inches. The wheel must stand 12 blows without breaking in two or more pieces. If it passes this test and satisfactorily meets all the other requirements, and the other test wheel selected stands the thermal test, and both show the required depth of chill, the balance of the 50 wheels are accepted. If either of the two wheels fail in any of the requirements the lot is rejected.

The thermal test is designed to guard against the failure of wheels from strains due to heat generated by the application of the brake shoe. This test calls for the wheel to be laid face up on a sand bed and a channel way 1½ inches wide by 4 inches deep molded with sand around the wheel. The clean tread of the wheel must form one side of the channel way and the flange the bottom. This channel way must be filled to the top with hot molten cast iron taken direct from the spout of the cupola in one ladle and poured direct from it at one point into the channel way. An examination of the wheel is then made after two minutes, and if found broken or any crack appears in the plate extending through the tread the 50 wheels represented by this test are rejected. As the quality of the metal and the depth of chill is a further requirement, all test wheels must be broken for examination, the metal in the plates must show a clean, soft gray iron, breaking with a ragged fracture. The depth of clean white iron must not exceed ⅞ inch or be less than ⅝ inch in the middle of the tread, and must not be more than ¾ or less than ½ inch in the throat, and must not show any clean white iron around the anchors or chaplets, or have a mottled appearance in any part of the wheel at a greater distance than 1½ inches from the throat and tread.

Specifications Criticised.

It is safe to assume that the wheel maker can easily meet the drop or thermal tests, give the required depth of chill, and show the inspector a clean, soft gray iron plate in all test wheels when broken, but the life and mileage may still be unsatisfactory. It is not wisdom for the superintendents of motive power to arrogate to themselves the right of absolute dictation in having the plates of all wheels when broken show a clean, soft gray iron, without any white or mottled appearance. It is well known to the progressive wheel manufacturer that a car wheel, to give six years' service under heavy loaded freight cars running at a high rate of speed, must be cast with a strong, mottled, hard, dense, close, homogeneous chilling metal which is known to them from long experience to have excellent qualities for wearing surfaces, and gives to the tread or chilled portion a close, dense grained metal possessing all the qualities of a steel tired wheel. The wheel manufacturers are obliged to live strictly up to the specification to have their product pass inspection and show a clean, soft gray metal plate, regardless of the consequences which are sure to follow.

Car wheels by the present method are cast from one ladle of molten metal, and there can be no dividing line drawn between the chilled tread and plates. The elements in the molten metal that give a soft gray metal plate enter into the chilled portion of the tread, and the ill effects of it can be readily traced to the limited mileage, thus accounting for the short life of cast iron wheels made in accordance with the railroads' own specifications. The slightest deviation from them would sacrifice a whole day's cast to the maker.

The lines are too closely drawn on the depth of chill. The difference between ⅝ and ⅞ inch makes limits too small to keep between, while at 1-36 inch above or below these figures the inspector rejects the lot. Some of these inspectors come clothed with authority to make it unpleasant for the wheel maker, and are at times very exacting in all the requirements asked for in the specifications, it being much easier for them to be critical than correct in such matters.

It may be asked why the railroad officials should dictate to the wheel maker the exact depth of chill (no more or no less) and also demand clean, soft gray plates, and then specify a six years' service guarantee with each and every wheel. Would it not be wisdom for them to leave the depth of chill and the softness of the plates to the discretion of the wheel manufacturer or else make this uncalled for inspection an absolute mileage guarantee, releasing the manufacturer from all further responsibility? After a lot of wheels has satisfactorily passed the above inspection the specifications call for a six years' service guarantee with all freight car wheels, and two years' service with all passenger, engine and tender truck wheels. They further require the manufacturer to replace (without expense) each and every wheel not filling the above mileage guarantee, and all those that are removed from service on account of failures due to any inherent defect, with a new wheel made in accordance with the specifications, and that replaced wheels must be furnished subject to the same inspection as the original wheel. It is also to be understood that any defect in wheels which calls for removal (with a very few exceptions) shall be considered an inherent defect.

It is, therefore, a well understood fact that cast iron wheels must possess several distinct features before they are ever accepted or put into service:

1. They must satisfactorily pass a severe and critical inspection and be free from every visible foundry defect.
2. They must have strength and tenacity enough to stand the drop test, and show physical strength enough to be above danger line.
3. They must be free from all shrinkage strains to withstand the thermal test, which suddenly heats up the tread unevenly to a black red heat, leaving the plates and center cold.
4. The wheel must have a certain depth of chill (no more or no less) and must show clean, soft gray plates.

Inspectors should accept wheels without reference to accident or fracture when living up to the specifications. They should not lose sight of common sense.

The Age of Old Car Wheels.

It has been the writer's custom for years when having old car wheels unloaded at the works to note down the year they were made and the maker's name. In connection with the works is a well equipped physical laboratory, where all incoming material is carefully tested, especially old car wheels. Each day a few wheels are

selected from the product of the different makers and tested for our own private information; when broken a piece of each wheel, with the shop number attached, is then sent to our chemical laboratory, where a careful analysis is made and recorded against that wheel and number. By this method we keep in close touch with what other wheel makers are doing, and by a careful study of their shortcomings we are able to correct our own.

In a lot of 9500 old car wheels already received this year from ten different railroads, seven east and three west of the Mississippi River, we found the product of 12 wheel foundries, with the following results:

6 per cent. of them were made in 1895
9 per cent. of them were made in 1896
11 per cent. of them were made in 1897
39 per cent. of them were made in 1898
19 per cent. of them were made in 1899
9 per cent. of them were made in 1900
7 per cent. were scattered back to 1880; some few were made in the present year, the maker's name and supposed cause of removal being withheld.

The gradual increase in weight and size of freight cars has during the past five years been so great that it is not believed to be wisdom for the wheel manufacturer to guarantee six years' service with wheels placed under heavy box cars running at a high rate of speed night and day, Sundays and holidays, making an average of 2800 miles per month, loaded both ways to their full capacity. The chilled cast iron car wheel of the present time seems to be the target upon which all the "big and little guns" of railroads are trained, but they must not expect too much of wheels made strictly to their own specifications, and cast from the best brand of charcoal iron by men of integrity and capacity who have been conducting their business for over half a century, and have faithfully earned a reputation of excellence for their product and are to-day an honor to the iron industry. The wheel maker is not at his best when his ambition is tied hand and foot by a too closely worded wheel specification, which should be corrected.

It is safe to predict that before many years of the new century have passed all chilled cast iron car wheels will be manufactured in geographical centers where the resources, adaptability and advantages are desirable for that class of work. There seems to be a growing demand among the superintendents of motive power of some of the leading railroads for a better and more uniform grade of wheels than they have been receiving of late years, but before they can accomplish this they will have to order all their wheels to be strictly made of a certain chemical composition and specify that they must be cast from an open hearth gas furnace metal. There is no doubt but that a plant capable of turning out car wheels with any chemical analysis called for is practicable and highly desirable. This method of ordering wheels will give the railroads just such a wheel as they order and pay for; it will also relieve the manufacturer from a great deal of trouble and responsibility, and exclude all elaborate deductions of the wheel inspector, as everything will be governed by their chemical analysis. If railroads insist upon this method of ordering wheels they will have to specify a definite chemical composition and abolish the physical tests and mileage guarantee, and it will only take the wheel manufacturer a short time to prepare himself with the means to furnish just such a wheel as they may see proper to order.

The writer has been asked by several railroad officials if wheel makers were prepared through their chemical laboratories to furnish wheels of any definite chemical composition that they may see proper to order in their wheel specifications. I must admit that they are not by their present methods of casting wheels. Carbon, sulphur and phosphorus will be the determining factors, and these three elements are unmanageable in a cupola. It is hard to realize the revolution that this development will cause in the car wheel industry. It not only calls for new plants, but a radical change in existing ones; but in either case it cannot help but be beneficial in the end.

An Ideal Car Wheel Foundry.

I have before me the working plans and all the details of an ideal car wheel foundry, with a capacity of 1200 wheels per day of 24 hours. The building is designed with the view of continuous molding, pouring and putting the wheels into annealing pits. In planning the works special attention was given to all the necessary conveniences for handling the material cheaply from the yard to the finished product, it being the object to make this plant up to date in every particular detail, embodying all the latest and best improvements known.

Without going into the cost and size of buildings, I will give a few of the general arrangements to enable the progressive wheel maker to see some of the advantages it possesses over the present methods of molding wheels in the forenoon and pouring them by the same men in the afternoon from each successive tap from a cupola, with variable results as to uniformity, depth of chill and physical qualities. In connection with the molding department in this ideal plant are three open hearth gas furnaces and four modern cupolas of the required capacity. It is not proposed that these will all be in use at one time, but only at stated intervals. It is not intended to take the molten metal direct from the blast furnace, but to go into the open market and buy a suitable quality of pig metal from different localities, and, after sampling it carefully by competent men, charge it into the cupolas in various proportions and relative quantities, and melt it in the best possible condition and pour it into the open hearth furnaces, and keep it there under a proper heat temperature until all the objectionable elements mentioned in the wheel specifications are taken out of the metal and those required added and chemically united. The open hearth gas furnaces are intended to be of the latest and best designs, and to be under the direction of a metallurgist of ability who fully understands the chemical composition of the metal wanted to fill any required analysis called for with absolute and unerring accuracy. He will also fully understand the nature and the effect that each element will have separately on the product, and the combined influence of all the elements when chemically united. After the molten metal has remained in the open hearth furnace until it is known to be of the proper temperature and chemical composition, it is then drawn from the furnace in a proper size ladle and removed from all further heat influence; the wheels are then poured from it at the same temperature, thus giving to the product an even shrinkage, a uniform depth of chill and physical strength far beyond the requirements for ordinary usage. There will be cast on each wheel a spur about 1½ inches high. The wheel inspector on looking over each day's cast for foundry defects will break off as many spurs as he may deem proper and send them to the railroad's chemical laboratory, where a careful analysis will be made for all the elements, and if they all come within the lines drawn in the wheel specifications that day's cast will be accepted. If any of the elements are on the outside of those lines that day's cast will be rejected.

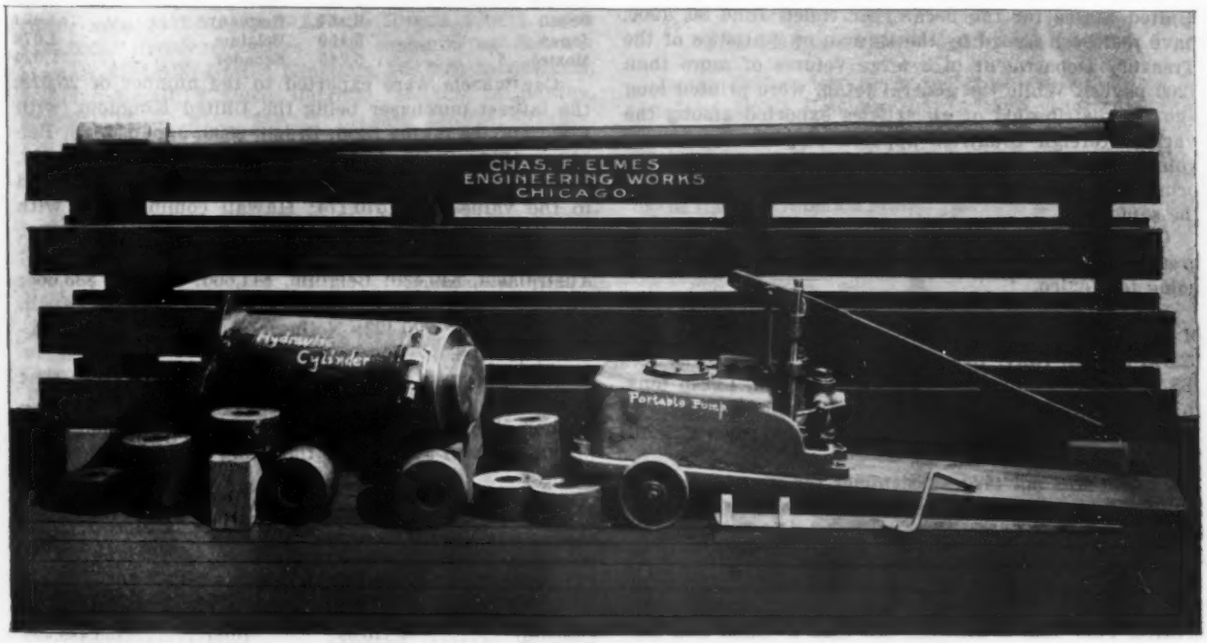
It is the intention in this ideal plant to have the molding carried on continuously by three gangs of molders and their helpers, divided off into three eight-hour shifts. Ten molders and their helpers start in on a shift of eight hours, each molder putting up five wheels per hour; after them come at stated intervals a gang of trained men, under the management of a man of executive ability, whose duty it will be to attend strictly to pouring the wheels, taking them out of the chillers and putting them into the annealing pits, preparing the sand, and leaving everything necessary in good shape for the next shift of molders. These men being trained in only one special branch of the business, and doing only that one thing, will soon learn to do it quickly, cheaply and accurately.

The successful wheel maker of the future will be prepared to make wheels of any chemical composition desired. He will be able to control the carbon, sulphur and phosphorus, and keep them within very narrow limits. When these three elements can be regulated to a nicety the wheels will be more uniform, their life more satisfactory, the physical strength increased far above all future requirements, the depth and quality of the chill regulated to an absolute certainty, and the wearing qualities of the tread greatly prolonged.

The Elmes Portable Hydraulic Press.

The Charles F. Elmes Engineering Works, Morgan and Fulton streets, Chicago, have brought out the portable hydraulic press here illustrated. This machine is designed to meet a demand for a portable appliance which will enable work to be done requiring a high pressure. It can easily be transported from one place to another and used wherever pressure work is to be done, instead of bringing the work to it. It is serviceable in pressing on or off cranks, couplings, wheels, armatures, or any other work of similar character.

The pump is rigged on wheels, while the cylinder is a separate piece so made that it can easily be set in its proper place. Piping connects the pump with the cylinder. The pump is operated with a lever by hand power, and one or two men can easily do almost any work required. Two men can easily exert up to 300 pounds pressure. This press is so constructed that the length of beams and rods can be regulated to suit the size of the work, thus making it of a capacity to suit a wide range of work. Cast washers or distance collars are used in connection with the rod to avoid the use of a very long threaded rod, as the threads are then liable to be injured. The machine is furnished with or without beams or rods, as these parts can often be easily secured by a purchaser at a remote distance, thus saving freight. It has been found serviceable in street railroad work, in handling machinery in mines and in repair work in electric stations. The company build any size and pressure desired, but the 300-ton press is the one commonly used.



Parts of Press Separated.

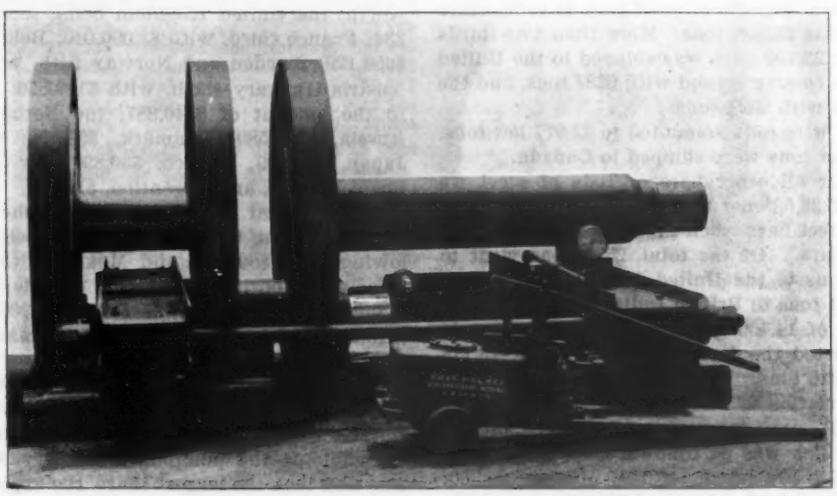


Fig. 2.—Pressing 12-Inch Crank Pin in 60-Inch Crank Disk.

THE ELMES PORTABLE HYDRAULIC PRESS.

The Standard Pneumatic Tool Company, Marquette Building, Chicago, and 141 Broadway, New York, have just brought out the Little Giant long stroke hammer. This hammer has only four parts, no valve block, only one valve, is therefore simple in construction, and is claimed to weigh less than any other hammer of the same kind. The company have just issued an illustrated circular showing methods of operation of these hammers. They now manufacture ten different sizes of hammers and claim to make the largest variety of piston air drills in the world.

The roll turners at Youngstown, Ohio, have made a demand for an increase in wages of 5 cents an hour, making the scale 35 cents an hour and double pay for overtime, with seven hours' work on Saturday. The

officials of the Republic Iron & Steel Company and American Steel Hoop Company are now considering the demand, but have not decided whether it will be granted.

The Distribution of Iron and Steel Exports in 1900.

The Destination of Exports.

Complete statistics of the foreign commerce of the United States for the fiscal year ended June 30, 1900, have just been issued by the Bureau of Statistics of the Treasury Department in a large volume of more than 1200 pages. While the general totals were printed long ago the distribution of all articles exported among the various foreign countries appears only in the annual volume. Following are given the figures relating to the principal exports of iron and steel and manufactures of the same:

Of iron ore exports, amounting to a total of 40,510 gross tons, 40,390 tons were sent to Canada, the balance going to Mexico.

Pig iron exports reached a total of 160,674 gross tons, of which 41,890 tons were shipped to Great Britain; 32,949 tons to Italy, 19,895 tons to the Netherlands, 18,188 tons to Germany, 18,061 tons to Canada, 13,246 tons to Belgium, 5875 tons to British Australasia, 5356 tons to Austria-Hungary, 2524 tons to Mexico and 1250 tons to Denmark.

Canada was our largest customer for scrap iron, taking 25,612 tons, out of a total of 48,111 tons; while Italy is credited with 11,131 tons. Japan bought 7940 tons of scrap and the United Kingdom 1158 tons.

Bar iron exports reached a total of 9228 net tons, of which 3038 tons were shipped to Canada, 2098 tons to Mexico, 1456 tons to Hawaii, 695 tons to Cuba and 685 tons to Chile.

Out of 12,977 net tons of wire rods sent abroad, 11,979 tons went to Canada and 874 tons to the United Kingdom. The total exports of steel bars or rods, other than wire rods, was 36,538 tons. More than two-thirds of this amount, or 23,700 tons, was shipped to the United Kingdom, Canada coming second with 6287 tons, and the Netherlands third with 2524 tons.

The exports of wire rods amounted to 12,977 net tons, of which 11,970 net tons were shipped to Canada.

Classified under all other bars or rods of steel we have a tonnage of 36,538 net tons, which, however, may include, besides steel bars, such grosser products as tin plate and sheet bars. Of the total, 2524 tons went to Holland, 23,700 tons to the United Kingdom, 6283 tons to Canada and 731 tons to British India.

Out of a total of 14,100 gross tons of billets, ingots and blooms exported the United Kingdom took 13,118 tons and Canada 916 tons.

The total exportation of steel rails in the fiscal year 1900 was 341,656 gross tons, the destination of the greater part of which was as follows: Canada, 117,600; Russia in Asia, 72,550; Japan, 40,519; Mexico, 26,300; Australasia, 18,473; British Africa, 12,598; Hawaii, 9343; Cuba, 8211; United Kingdom, 6739; Sweden and Norway, 3911; Netherlands, 3216; Brazil, 3171; Portugal, 2600; China and Hong Kong, 2130; Argentina, 2210; British East Indies, 1500; Belgium, 1434; Italy, 1280; Portugese Africa, 1199, and France, 1051 gross tons.

Iron sheets and plates to the extent of 9091 net tons were exported; 3763 tons going to Canada, 1063 tons to the United Kingdom, 1012 tons to Mexico, 943 tons to Argentina, 839 tons to Hawaii and 542 tons to Cuba; while the exports of steel sheets and plates reached 39,763 gross tons. Of the latter product the heaviest shipments were made to Australasia, 17,348 tons; the United Kingdom coming next, with 11,776 tons; Canada third, with 5597 tons, and the Netherlands fourth, with 2265 tons. Only about 160 tons of tin plates were sent abroad in the last fiscal year, nearly all of which went to Canada and Mexico.

The principal destinations of 56,275 gross tons of structural iron and steel were as follows: Japan, 10,207; Canada, 7721; United Kingdom, 6888; Hawaii, 2895; Netherlands, 1502; British East Indies, 8471; Mexico, 7689; Argentina, 3142; Cuba, 2046, and Australasia, 1135 gross tons.

The exports of wire were very large, amounting to 118,386 net tons, and were widely distributed. The principal buying countries and the amounts taken by each were:

	Net tons.		Net tons.
British Australia	29,064	British Africa	3,905
Argentina	18,828	Uruguay	3,019
Canada	17,889	Cuba	2,789
United Kingdom	13,847	Chile	2,069
Brazil	6,157	Germany	1,491
Japan	5,450	Belgium	1,076
Mexico	5,243	Ecuador	1,024

Car wheels were exported to the number of 25,518, the largest purchaser being the United Kingdom, with 5735; Mexico taking 3496; Brazil, 2590; Japan, 2476; Belgium, 1711; Cuba, 1189; Spain, 1132, and Australasia, 1048. Castings, not elsewhere specified, were exported to the value of $1,576,174; Hawaii coming first, with $468,841 worth; Canada taking $316,805 worth; Germany, $179,478; Mexico, $137,672; United Kingdom, $128,306; Australasia, $49,430; Belgium, $41,666; France, $33,665; Sweden and Norway, $32,980; Russia, $27,532; Japan, $26,118; Cuba, $20,423; Netherlands, $20.419, and Denmark, $11,108.

The exports of machinery have become so large that they are itemized in the present report much more closely than they were formerly. Of the varying classes of machinery sent abroad, the following list shows the total values:

Cash registers	$813,096	Metal working	7,193,390
Laundry	441,562	Pumps and pumping	3,112,525
Printing	1,219,774	Shoemaking	1,163,265
Sewing machines	4,541,774	Locomotives	5,592,403
Fire engines	14,915	Boilers	1,767,856
Stationary engines	673,197	All other	21,913,202
Typewriters	2,697,544		
Electrical	4,340,992	Total	$55,485,495

Taking the destinations of some of the principal lines of machinery, we find that Germany was our largest customer for metal working machinery, with $2,479,939 worth; the United Kingdom being second, with $1,883,234; France third, with $1,090,046; Belgium fourth, with $656,129; Sweden and Norway fifth, with $199,068, and Austria-Hungary sixth, with $189,856. Italy purchased to the amount of $146,887; the Netherlands, $141,489; Russia, $124,589; Denmark, $53,038; Canada, $46,660; Japan, $37,399; Mexico, $30,895; Switzerland, $20,008; Spain, $11,384, and Argentina, $10,955.

Of electrical machinery, by far the largest amount was sent to the United Kingdom, $1,568,653; Canada following with $800,423 and Mexico with $445,208. The principal exports in this line, outside of the countries named, were as follows: France, $266,470; Argentina, $215,505; Australasia, $187,459; Germany, $107,531; Japan, $102,944; Cuba, $95,093; Philippine Islands, $91,213; Brazil, $87,058; Italy, $65,108; British West Indies, $56,154; British Africa, $46,163; Belgium, $45,750; Russia, $37,172; British East Indies, $29,050, and Spain, $14,753.

In pumps and pumping machinery the United Kingdom also took the largest share, the exports to that country being valued at $795,729, while $364,839 worth were shipped to Germany; $237,168 to France, $219,374 to Hawaii, $193,052 to Australasia, $184,711 to Russia, $159,190 to Canada, $137,136 to British Africa, $129,590 to Mexico, $96,151 to Austria-Hungary, $62,515 to Cuba, $59,537 to the Netherlands, $57,615 to Belgium, $56,496 to the British East Indies, $53,124 to Japan, $41,830 to Sweden and Norway, $32,349 to Denmark, $29,604 to Argentina, $21,377 to Italy, $18,659 to the Dutch East Indies, $18,355 to Porto Rico, $17,520 to China, $16,124 to Brazil and $13,224 to the Philippine Islands.

Five hundred and twenty-five locomotives were exported, of which there went to:

Mexico	93	United Kingdom	84
Russia	84	Canada	51
British East Indies	27	Belgium	23
France	22	China	20
Japan	19	Brazil	18
Cuba	11	French Africa	10

Of stationary engines, 1140 were shipped to foreign countries, the principal destinations and quantities being as follows:

Australasia	169	Canada	153
United Kingdom	128	Mexico	127
France	80	Cuba	66
Germany	44	Denmark	43
Brazil	34	Japan	33
Argentina	31	Russia	31
Sweden and Norway	29	Belgium	27
Porto Rico	22	British East Indies	19
Colombia	14	China	15

The total value of boilers and parts of engines exported was $1,767,856. Canada stands first as a purchaser in this field, with $285,775; Cuba second, with $258,519; Mexico third, with $177,513, and Asiatic Russia fourth, with $139,355. Other countries took amounts as follows: Hawaii, $131,693; United Kingdom, $98,669; Australasia, $96,172; Brazil, $72,295; Belgium, $53,528; Argentina, $50,281; Porto Rico, $44,117; Japan, $36,724; France, $29,673; Germany, $29,580; British Africa, $22,601; Philippine Islands, $19,639; British West Indies, $18,334; Peru, $15,474, and British Guiana, $13,934.

Under the head of "All Other" machinery are classed $21,913,202 worth of exports. The largest customers for these products were:

Mexico	$4,889,875	Canada	$3,949,899
United Kingdom	2,325,959	Hawaii	2,031,394
Australasia	1,378,664	Germany	818,396
France	616,254	Japan	554,521
Cuba	615,795	Belgium	443,282
British Africa	510,104	Sweden and Norway	318,796
Russia	453,841	Denmark	242,279
Argentina	306,534	Netherlands	186,464
Porto Rico	197,774	Italy	155,134
Brazil	173,547	Santo Domingo	115,576
Russian China	153,851	Chile	105,182

The export trade in pipes and fittings was heavy, shipments amounting in value to $7,024,888 being made, of which the principal purchasing countries were:

United Kingdom	$892,487	Denmark	$137,734
Mexico	859,693	Russia	54,824
Canada	706,445	Porto Rico	45,382
Hawaii	643,149	Peru	45,088
Japan	631,356	France	44,222
Cuba	529,349	British West Indies	35,021
Netherlands	479,865	Brazil	32,370
Belgium	392,598	Italy	28,210
British East Indies	274,918	Chile	25,380
Germany	215,325	Sweden and Norway	24,494
British Africa	215,487	Roumania	23,975
Argentina	184,149	Venezuela	19,713
Australasia	170,251	China	19,268
Dutch East Indies	138,404	Colombia	17,684

It is not quite certain whether these figures take cast and wrought pipe together or not.

The McClintic-Marshall Construction Company.—The new plant of the McClintic-Marshall Construction Company, which has been under erection at Rankin, near Pittsburgh, for some time, will soon be completed. Part of the machinery is now running and the firm expect to be in full operation in June. Several of the larger buildings, which are of brick and steel, are almost ready for the roof, and the engines, rolls and other machinery are now being installed. The plant will cover about 4½ acres and will cost about $600,000, having a capacity of 4000 to 5000 tons of material a month. The McClintic-Marshall Construction Company have some very large contracts on hand and are operating their shops at Pottstown, Pa., to full capacity. They recently took a contract for the buildings for the ordnance plant of the Midvale Steel Company, at Nicetown, Philadelphia. Some time since the concern took contracts for the steel buildings for the new store of Marshall Field & Co., at Chicago. This contract is well on toward completion. They have also taken a contract for steel buildings for the new tube mill being built by the La Belle Iron Works at Steubenville. From the Philadelphia & Reading Railroad Company they have received a large order for plate girders, and also for a coal trestle for the Lukens Iron & Steel Company at Coatesville, Pa. The firm are badly in need of their new shops at Rankin, as the capacity of their Pottstown plant is not large enough to take care of the business they have on hand.

Central Pipe & Valve Company.—The Central Pipe & Valve Company have been organized at Pittsburgh, and have secured possession of the old plant of the H. W. Minnemyer Mfg. Company, on River avenue, Allegheny. This works is now being overhauled and fitted up, and will be used by the new concern in the manufacture of valves and pipe fittings of all kinds. Those interested in the new concern are Jas. J. Jelly, Wm. Felton, Jos. Keenan, Jno. W. Kelly and Frank Felton. J. J. Kelly will be president of the concern, and is now connected with the Howe, Brown Works of the Crucible Steel Company. Some of the machinery has already been installed, and the plant will be in operation before long.

The Eclipse Low Water Indicator.

In the Eclipse low water indicator, manufactured by the John Davis Company of Chicago, the pipe runs through the top of the boiler within three or four inches of the flues, or closer if desired. As long as the bottom of the pipe is covered with water a fusible plug in the top of the pipe remains intact. As soon as the water gets below this point, the indicator, which is in a perpendicular position, drains itself of water, steam supplants it, the plug fuses, and the steam continues to escape until the valve is closed. The valve is always locked open, which is a safeguard to the engineer, who is held responsible for explosions and burnt boilers. This indicator is used with a 1 to 1¼ inch pipe inside the boiler, as a ½-inch pipe is liable to get stopped up. An air cock on the side of the indicator enables the engineer to ascertain at any time if the pipe is free.

THE ECLIPSE LOW WATER INDICATOR.

The Structural Iron Workers' Wages.—The bridge and structural iron workers in a number of Western cities have succeeded in securing the signatures of employers to an agreement containing the following provisions: "Employment shall be given only to members in good standing of the union, except where the union is unable to furnish a sufficient number of men, in which case the workmen shall be given two weeks in which to join the union. The minimum wage is to be 25 cents an hour, with time and one-half for overtime and double time for Sundays and holidays; ten hours to constitute a day's work. The contract is to continue in force until September 1, next, when the minimum wage is to be fixed at 30 cents an hour and the hours of the work day reduced to nine. The contract will extend to April 1, 1902. Under the agreement both sides will hereafter submit all differences to arbitration.

The Suppression of Smoke.

Edward Atkinson, president of the Mutual Boiler Insurance Company of Boston, has issued the following circular:

An effort is now being made to prevent Boston becoming a smoky city. We have been asked to co-operate. The direction of this effort now is to secure a more rigid enforcement of city ordinances, or to prohibit the use of bituminous coal which might work great economic injury and may be wholly uncalled for.

We believe a surer way is to prove that smoky chimneys give evidence of great waste of fuel if such is the fact. The actual calorific value of the smoke and soot discharged from the chimney is of little account, but the continuance of smoke in any considerable volume for more than five minutes, which is the limit allowed by the Boston city ordinance, may be assumed to give evidence of the misuse of the coal, or of loss of heat from bad methods of firing, or because the steam plant is either defective or overworked.

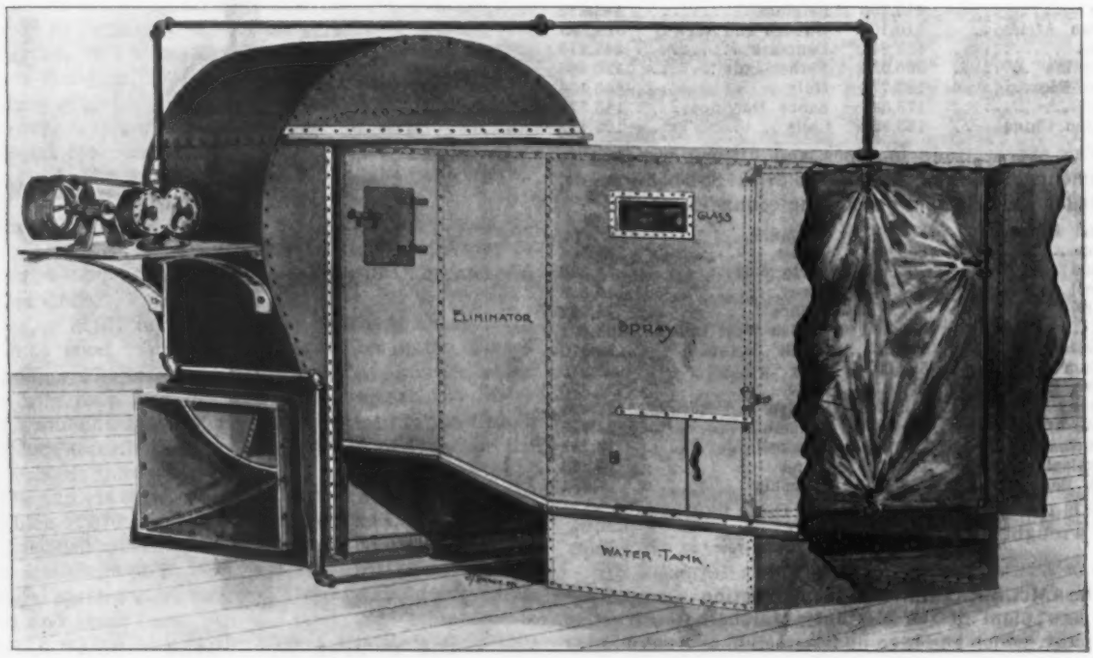
The writer's attention was called to this matter many years since when he visited the steam plant of the Great-head tubular tunnel from the heart of the city of London to the Surrey Side. The chimney stack was very low, of large section worked by forced draft. The fuel was a very dirty culm of bituminous coal, which would not be worth moving by rail in this country, yielding about 18 per cent. of ash. Yet there was no dark smoke from the chimney and none is allowed from such chimneys in London, the smoke nuisance there coming from private use of soft coal in dwelling houses. The writer also examined boiler plants in Scotland near the source of the same kind of culm, brought by gravity 18 miles from the mine; taken from the bins automatically, fed and stoked automatically, the ashes removed automatically; three men with little to do watching the operation of boilers yielding 4000 horse-power; no smoke.

The writer has not made personal observation of our factory cities and towns; his hypothesis is that smoke and soot cannot be tolerated where fine paper is made, where fine cotton fabrics are spun and woven, or where large bleacheries and print works are in operation. He therefore submits the problem, especially to the managers of works in such places, on how the smoke nuisance may be prevented.

It is held that the most effective smoke consumer in a small steam plant is a skillful and well paid fireman, but in the larger plants automatic stokers, the down draft and other devices for firing, are making their way. It may happen that by collating the information now asked, we may not only help save Boston from becoming a smoky city, but may also deduce some general principles which will be of service to our members.

The Thomas Acme Air Washer and Purifier.

We herewith illustrate a new device manufactured by Thomas & Smith of 16 North Canal street, Chicago, and called Thomas' Acme air washer and purifier. The primary object sought by the inventor was the removal of dirt or other offensive and injurious matter from the air introduced into buildings by blowers or fans used for either heating or ventilating. The air after passing through the apparatus is not only clean and dry, but the impurities are eliminated, and a healthy degree of humidity is maintained irrespective of any outside hygrometric changes. The system has also simplified the question of cooling air in summer, as with a reasonable quantity of ice in the water tank the temperature of the passing air can be reduced many degrees. The apparatus consists essentially of a spray chamber and an eliminator. The spray pipe contains a number of nozzles set at regular distances. Between the two walls of the spray chamber is a suspended partition which causes the air to go under it, thus passing through the water from the nozzles, which are placed on one of the chamber walls at a level with the bottom of the partition. The air, thus passing through the water, is freed from some of the dirt or impurities, and then passes upward to the eliminator. This consists of a series of steel baffle plates, placed in alternating rows. When the air strikes the first row of plates it rebounds to the second, then to the third, &c., taking a circular motion, which retards the solid impurities left in it and deposits them on the baffles, sifting and drying the air. From the eliminator the air passes to the inlet of a fan. In winter tempering coils are used to keep the water from freezing. The fan then forces the purified air through the usual heating coils. All heavy particles, such as soot, dust, &c., are deposited at the bottom of the tank. The apparatus is stated to be very economical in the consumption of water, always ready to do its work and not liable to easily get out of order.



THE THOMAS ACME AIR WASHER AND PURIFIER.

It has been installed in a number of important buildings in Chicago with gratifying results. A notable in-

stance is the installation in the Chicago Public Library, which is located in a district surrounded by smoky chimneys, spice mills, coffee roasting establishments, &c. No odors are now observed in the building, and the books and papers are free from former accumulations of dust and soot.

Harbor Improvements at Chicago.

In removing the obstructions to navigation and the flow of water through the Chicago River, the trustees of the Sanitary District of Chicago, who have this problem in charge, are pushing their work vigorously and as rapidly as the many obstacles to be overcome will permit. The first and probably the most important part of the work consists in the ultimate removal of the center pier swing bridges. The swing bridge at Taylor street

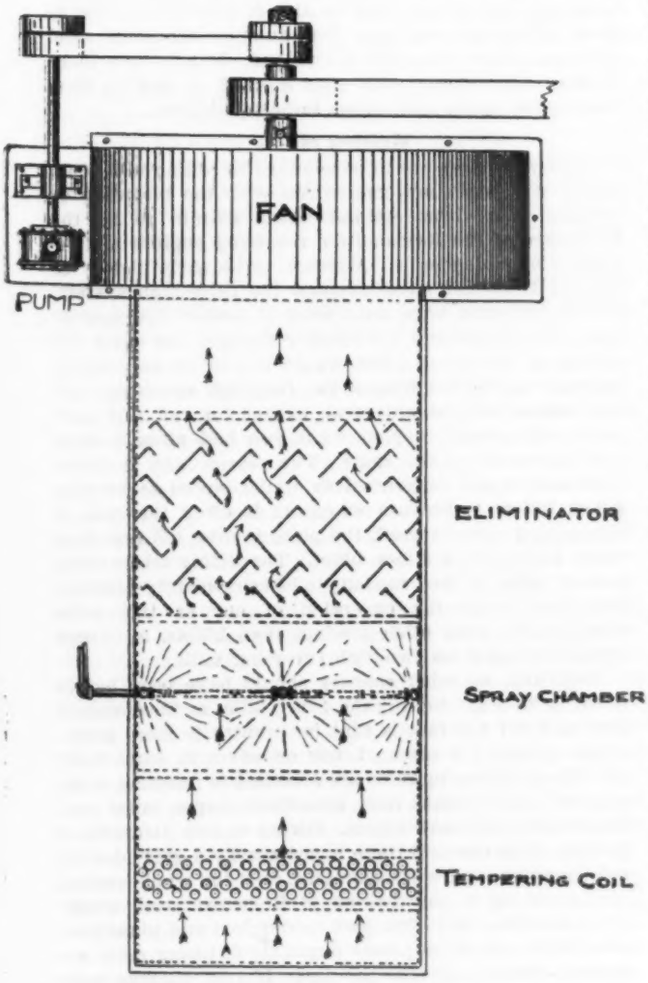


Fig. 2.—Plan.

THE THOMAS ACME AIR WASHER AND PURIFIER.

has been entirely removed and replaced by a Scherzer rolling lift bridge, recently completed. The specially obstructive railroad bridge which is near the Taylor Street Bridge will be removed within a few months, as the new double track Scherzer bridge of 275 feet movable span will soon be completed and placed in service. Contracts have been awarded and work has commenced upon the new Scherzer bridges replacing the swing bridges at Canal and main streets. Bids are advertised to be submitted May 8, 1901, for a Scherzer bridge to replace the swing bridge at Randolph street.

The Scherzer Rolling Lift Bridge Company, Chicago, have also recently completed plans for a new bridge at State street to replace the present swing bridge, which was extremely obstructive to navigation on account of a sharp bend in the channel of the river at the site of this bridge. The new bridge will give a clear, unobstructive channel for navigation 140 feet wide; the movable span, center to center of bearings will be 161 feet 8 inches, the roadways, center to center of trusses, will be 40 feet 6 inches wide, with two sidewalks, each 11 feet wide. As State street is the principal retail business street of the city of Chicago, and the bridge is near the business center, it was decided to make the outlines of the new bridge as artistic as possible without increasing the present cost of the structure. The bottom chord is arched and the top chord projects but slightly above the roadway, thus giving a deck bridge with an unobstructed view. The new bridge when completed will not only facilitate navigation, but will present a striking contrast to the present unsightly swing bridge. The new bridge without extra cost for ornamentation will be in harmony with the growing demand for more artistic bridge structures at Chicago. The bridge is so designed that appropriate ornamentation may be added at any time in the future when funds are available for such purpose. Plans have also been completed for new Scherzer bridges to replace the swing bridges at Harrison street and Eighteenth street, and within a few weeks the Scherzer Company will have completed plans for a new bridge to replace the swing bridge at Polk street.

All of the above new bridges will give an unobstructed channel of 140 feet in width, or wide enough to pass side by side two of the largest lake or ocean vessels likely to enter the harbor of Chicago for many years to come. The wide channels provided will enable vessels to pass these bridges very rapidly, and time will also be saved, as all bridges are designed to be operated by electricity and may be opened or closed within 30 seconds.

As soon as these bridges are completed and placed in service the work of removing the other obstructive swing bridges can be proceeded with, without unduly interfering with the street traffic across the bridges. After all the swing bridges have been removed and replaced by the more modern type of bascule bridge and the obstructive tunnels have been lowered or removed, the largest lake vessels can readily and rapidly reach any point along the 56 miles of dock frontage comprising the present internal harbor of Chicago, and the delays heretofore caused by the slow passage of the vessels through the narrow openings provided by the old swing bridges will be obviated. The highway traffic will also be greatly facilitated, as the present comparatively small and frequent vessels will be replaced by larger vessels, less frequent but carrying a larger tonnage. The large, comprehensive plan under which the harbor improvements at Chicago are now being executed so vigorously indicate that Chicago will not only retain all of its present large marine commerce, but that it will also be prepared for the larger vessels and great increase of marine commerce certain to follow the completion of an adequate ship waterway within the United States, either to the Gulf of Mexico or to the Atlantic Ocean.

The Colonial Steel Company.—The Colonial Steel Company of Pittsburgh have applied for a charter of incorporation. The incorporators are James W. Brown, Geo. A. Howe, T. Howe Childs, Chas. M. Brown, and Louis B. Hayes. The first three parties mentioned formerly composed the firm of Howe, Brown & Co., Limited, crucible steel makers of Pittsburgh, but who were taken over by the Crucible Steel Company of America. James W. Brown was made first vice-president, and was also on the Board of Directors of the Crucible Steel Company, but severed his connection with that concern some time since. The Colonial Steel Company have bought a site of about 50 acres of land at South Monaca, 27 miles from Pittsburgh, on the line of the Pittsburgh & Lake Erie Railroad. It is their intention to go ahead with the building of a large open hearth and crucible steel plant, work on which will be pushed as fast as possible. The concern expect to make steel early in 1902. None of the contracts for the new plant have yet been placed, but engineers are now drawing up plans and specifications. The new concern will have a capital of $1,000,000, and James W. Brown will be president. It is the intention to put up a modern steel plant, and it is possible that a blast furnace may also be built, but this has not been definitely decided.

A Comparison Between American and British Rolling Mill Practice.*

BY WILLIAM GARRETT, CLEVELAND, OHIO.

The condition of the iron and steel trade in Great Britain to-day is attracting a great deal of attention. She who formerly held the supremacy in the manufacture of iron and steel has not only lost the same, but her shores are invaded by foreign material, in particular from the United States and Germany, who send there thousands of tons of raw and finished material, part of which is to be finished and part re-exported to foreign countries.

Great Britain is not only mistress of the seas in times of war, but is also mistress of the seas in times of peace. Her ships are found on every sea—at every shore—in every clime. Her means for reaching foreign countries are unequaled by any, and this, combined with her past wonderful resources in the way of fuel and iron ore, and the fact of Great Britain was the home of a Cort, a Bessemer, a Mushet, a Siemens, a Thomas, a Gilchrist and a Lowthian Bell (the achievement of every one of whom in their day and generation has opened an era in the manufacture of iron and steel), is what gave Great Britain the supremacy. 1, the raw material; 2, the market, and, 3, the brains. But in the course of time conditions have changed, and the fact that coal is being delivered in Newcastle, as it were, or material is being delivered at the door of those who at one time controlled the manufacture of this material, proves this to be the case. This being so, what are the conditions that have changed? Lack of raw material? It appears not, for you are the second largest producer of coal in the world—in 1898 producing 220,085,303 tons. Both Sir Lowthian Bell and C. Kirchhoff are trying to outvie each other in proving that pig iron—the base of iron and steel—can be manufactured in Great Britain as cheaply as anywhere in the United States, taking into consideration the long haul necessary in the United States to bring the raw material together to make pig iron. Sir Lowthian Bell is very skeptical as to the possibility of any foreign country being able to land iron or steel on the British shores in competition with Great Britain, believing that the many thousands of miles which iron and steel have to be transported must act as a barrier never to be overcome. Is it because Great Britain is no longer mistress of the seas, and her foreign markets are not so accessible as in the past? No one for a moment believes that there ever was a time when she was better able to reach any part of the world than at the present time, and new markets are being opened up every day. What do the trouble in China and the Transvaal war mean? In the end more markets, not only for British products, but for the products of the whole manufacturing world—this through your "open door" policy. If it were not a political question it might be admissible to dwell on this as the one reason why you are losing your supremacy in the manufacture of steel and iron. Since it is not because you cannot make your pig iron as cheaply as it is made elsewhere, and since it is not because of the curtailment of your markets, and since it cannot be because of your ignorance of scientific truths (Sir Lowthian Bell points out with pride your scientific colleges at Newcastle, Leeds, Nottingham, Sheffield, Edinburgh and Glasgow for teaching the sciences of metallurgy), what then can be the reason why you are underbid in regard to rail contracts for abroad, why tin plate bars are being shipped by thousands of tons right into your tin plate district, why thousands of tons of soft steel billets are being delivered to your rod mills and merchant mills, why thousands of tons of plates are being delivered right at the back door of many of your steel plate makers, and why skelp and strips for the purpose of making pipe and tube are landed next door to your manufacturers of strips? It would seem that all the blame lies with the men who start with the pig iron and put it into the finished material.

But before going into this question just think for a moment what it means for the Pittsburgh manufacturers to deliver their product in England or Scotland. It means that they have to ship their material over 3000 miles by water and nearly 500 miles by land, at a cost of between $5 and $6 per ton, or about 25 shillings. It means that all things being equal by way of manufacture in both countries, the Pittsburgh manufacturer should have to get his ore and coke for nothing in order to be able to do this. Therefore, it cannot be all on account of the advantage the manufacturer of the United States has in regard to cheaper raw material. To come to the point, where does this difference in the cost of the manufacture come in? Assuming that we are already agreed—which we have on the best of authority—that Great Britain can produce pig iron as cheaply as the United States. During the period of 1893 to 1896 many thousands of tons of Bessemer pig iron were sold for $9, and 4-inch billets could be bought in the open market at that time for $14 per ton, a difference of $5, or 21 shillings, per ton, so you must be able to convert pig iron to steel billets for less than that amount, for some steel makers at that time paid a dividend. If not, then there is something wrong with your method of making Bessemer steel ingots and rolling same into billets.

Rolling Mills.

As my remarks are to be confined to rolling mill practice, I will begin my comparison with the blooming or cogging mill. I understand Great Britain to be the birthplace of the Ramsbottom reversing engines and reversing blooming mills. America, in its early history of making Bessemer steel, adopted the three-high system, and no two men have done more to perfect this system than John Fritz and his brother George, but since the advent of the 4-inch billet, which is now so universally used in the United States, the two-high reversing mill has become almost universal, except for rail mill purposes. We simply copied what you had already done and improved on the same. The reason why a three-high mill is not considered as well adapted to making 4-inch billets is because when, as is often the case, a 6000-pound ingot is used, the piece is over 125 feet long when finished to a 4-inch billet. The lifting tables must be very long; in fact, too long to be conveniently handled. Therefore, with the exception of one or two mills which make some other product than billets, all 4-inch billets are made on two-high reversing mills.

Logically, no other country should have been before Great Britain in adopting the 4-inch billet as the standard size, and yet the fact is that no country is more prejudiced against the same. I will endeavor to state why: All of your blooming mills are attached to finishing mills, upon which you make rails, structural shapes, large merchant bars and small billets. Owing to this diversity of product from one mill there is necessarily a great deal of roll changing, and when changing rolls the whole system is stopped up to the making of Bessemer steel—everything standing still, time lost, money lost and plant nonproductive. In some places duplicate finishing mills are used in order to prevent this loss. If your cogging mills are adapted to make 4-inch billets, as they are in the United States, and your small merchant and rod mills adapted to take a 4-inch billet, all this loss will be obviated, and the expense for an extra mill is unnecessary, as you could be making 4-inch billets while changing rolls. In order to make, say, a 2-inch billet, you must go through nearly all the motions of making a rail, except straightening, drilling, &c.; must use the whole train and the same number of men, and a 2-inch billet costs nearly as much as angle bars. You should also be able to make slabs suitable for making light plates, but you roll nothing but blooms suitable for the finished material for which your finishing mill is adapted. All that is necessary to make a 4-inch billet and slabs, and any size of bloom for rails, &c., is a pair of rolls exactly the same as in general use on a blooming mill in the United States, with the necessary room for shearing and taking care of the billets. That it is desirable to find a market for what sizes you can make on your blooming mill while changing rolls is evident, seeing that your German competitors have recently adapted themselves to take a 5-inch square billet, which they roll at one heat into wire rods; in fact, in some places they take a 6-inch or 7-inch bloom and roll it into rods at the one heat. These blooms

*A paper read before the Iron and Steel Institute.

are sold at a reduced rate from a 2-inch billet, as they are able to make those sizes on their blooming mill while changing rolls. This is leakage No. 1, adding to the cost of all the material you make on your reversing blooming mills. Next is the time lost on account of the irregular way in which you keep your mill filled up with material. In America the greatest effort is made to find something for the blooming mill to do while changing rolls, and to keep the mill continually full of material. It is an acknowledged fact in regard to American mills that stoppage from breakages or some unseen cause are considered a misfortune by the management. Time lost through not keeping the mill full is considered a crime, and results in the immediate dismissal of the responsible party. Go to the manager's office in connection with any well established steel plant and you will see on record a statement of what has been done in every department during every hour of that day, and the cause for every minute of lost time, if any. But it may be said by some that owing to close attention to this point the American mills and engines are better constructed than those in Great Britain to stand this, you may say, undue pressure. I may say here that the blooming mill holding the world's record for the production of 4-inch billets per 24 hours is that at the Lorain Steel Company, Lorain, Ohio, having produced 1260 gross tons in that time, from an 18 x 20 inch ingot weighing 550 pounds. It is driven by a Galloway engine, and in justice to the English engine builder, I may add that no engines in the United States give better satisfaction than the three Galloway engines at the plant of the Lorain Steel Company.

Rail Mills.

I will now briefly consider your rail mills. Why is it that you do not make a larger tonnage on the same? Is it because you do not desire to? If this is the case I have nothing further to say on that point. However, if the reply is that you cannot find a market for any more tonnage, then I will ask why the American manufacturers ship so many thousand tons of rails to the foreign markets that were once yours, and underbid you to get orders? Why is it that you are making rails in every two-high reversing mill in your country, and in doing that are not only losing your orders for rails, but allowing thousands of tons of tin plate bars to come into your tin plate districts? If you could produce more rails in a given time you would have more time to make tin plate bars, and if your mills are not so well adapted as they ought to be for making rails or tin plate bars, is is not better to remedy the evil than to lose trade? But are you taking out the maximum production from the rail mills you have, and have you the best adapted mills for making tin plate bars? I question both, from what I have seen in this country and in the States. Do you keep your rail mill full of steel from 6 in the morning to 6 at night, as they do in the United States, where this is the rule and not the exception. If not, then that is one reason why you cannot get the same production and manufacture as cheaply. Do you keep two bars in the roughing and two bars in the finishing train at the same time? If not, then you differ from the American practice—this, of course, on three-high mills—and this is another reason why your output is not so great. But are your reversing mills adapted so that two bars can be handled in the same pair of rolls at the same time? Perhaps not, but such is the difference in conditions. It is my opinion that you try to roll too many different kinds of shapes and sizes on the one mill, making your reversing mill a "Jack of all trades and master of none." For a jobbing merchant mill, in my opinion, no mill is more suitable than a reversing mill, and when the Lindsay coil clutch gains the full confidence of the steel manufacturer a reversing mill for rolling large sizes of merchant bars will become more popular than ever. However, in view of what is being done in the United States we cannot admit that it is the best type of mill for rolling rails.

Tin Plate Bar Mills.

One of the "stock" arguments of the British iron and steel manufacturer, when his attention is drawn to the large production of the American rolling mills, is as follows: "If we had such large demand for such special material as you have in the United States we would not hesitate a moment to put in special mills and appliances to handle the material and produce as much and as cheaply as you do." What about tin plate bars? Prior to the year 1892 few, if any, tin plates were made in the United States, and yet that country was the largest user of tin plate in the world. For years previous to that time they imported from this country from 300,000 to 350,000 tons of tin plate per annum, and this was but 75 per cent. of what Great Britain made. Here we have a demand for about 440,000 tons of tin plate per annum, calling for approximately 550,000 tons of tin plate bars every year. Isn't that a sufficient amount of special material and enough to induce some one to put up special mills for making tin plate bars? It seems not, for if anything the mills you make tin plate bars on to-day (after losing nearly all of that trade) are better than they were when you had almost a monopoly on the manufacture of tin plate for the world; so you must confess that due diligence was not made with a view of taking advantage of the favorable conditions at that time. What did your American cousins do with the demand for tin plate bars at about 100,000 tons per year less? Why, some of the best, if not the best, machines we have in the United States for the rolling of steel are mills for making tin plate bars, and to-day they are pushing their tin plate bars in 1000-ton lots right into your tin plate districts. Among the most noted tin plate bar mills in the United States are those at the following plants: The Duquesne plant of the Carnegie Steel Company, the National Tin Plate Bar Mill at Youngstown, Ohio; the Bellaire Steel Company, Bellaire, Ohio, and the mill at Vandergrift, lately owned by the Apollo Iron & Steel Company (all of which mills many of you have seen). Each of these mills is of a special type, and from the ingot to the finished bar—even to the placing of the latter on the cars—all of the work is done by machinery. The result is that tin plate bars are sold for $1 per ton above (and in some cases less) the cheapest steel product in the country— *i. e.*, a 4-inch billet. It is true that these mills cost a great deal to build, but money is no object to the American manufacturer if he can but see a fair return. I must confess, from my experience and observation, that the British manufacturer is rather conservative on this point. Here you are to-day with a large tin plate trade and no effort is being made to prevent foreign competitors shipping tin plate bars right into the country from a distance of 3500 miles.

Structural Steel Mills.

I will touch but briefly on this subject of structural steel, as I cannot see such a marked difference in the British and American methods, seeing that the Carnegie Steel Company roll all of their structural steel on the three-high system, while the Pencoyd Iron Works roll their material partly three-high and partly two-high. Opinion is pretty evenly divided as to which is best and will make the largest tonnage. However, on a three-high mill with a positive running engine the ingot must be cut into two parts, and the first and last end of the shaped bloom must be cut off. The cost of labor may be less on a three-high mill, but the percentage of finished product is greater on a two-high reversing mill. I understand the latter is the practice in this country and on the Continent. In this case it appears to me about a stand off.

Plate Mills.

It may seem strange to hear an American say that he believes a two-high reversing mill for rolling plates to be better than the three-high mill with the small roll in the middle, but I must frankly confess that such is my opinion, this, bear in mind, for plates 5-19 inch thick and above. Were it not that the reversing engine takes more steam than a positive running engine I think there is no question of the advantages in favor of a reversing mill. I base my opinion on the following:

1. There are no lifting tables required, which are very hard to keep up.

2. If the three-high mill is better adapted to roll thin plates the reversing mill is better adapted to roll thick plates. Placing a 5 or 10 ton slab on lifting tables necessitates the waste of so much energy in raising and lowering the said slab.

3. A reversing mill is better adapted for having extra

sets of finishing rolls, which add to the life of the rolls and give a smoother surface to the plates.

But then it may be said, "Look at the enormous output of the American three-high plate mills, some of which have made over 10,000 tons of finished plates in a single month." To that I will reply: Keep a two-high reversing mill as full of material as they do in the States and your product will be no less; in fact, it ought to be greater. Go at any time during the day or night to see a three-high plate mill in operation at Homestead works of the Carnegie Steel Company, where, as regular as the tick of a clock, the slab is placed on the table which carries the same into the rolls, one slab after the other; when the plate is going through the last pass, in fact, the slab has often to be stopped to give time for the rolls to be raised to the proper place to suit the thickness of the same. Do the same thing on some of your modern plate mills in Great Britain and mark the increase in the output. In rolling a plate ⅜ inch or ½ inch thick from a well heated slab on a three-high mill, before it gets to the last pass or two it is generally the custom to wait so as to finish the plate at the required heat, in order to get the necessary tensile strength and a smooth surface. You will observe exactly the same conditions on a first-class two-high reversing mill. If this is so, whence comes the advantage so far as output is concerned? On a three-high mill plates must be finished in such shape as to suit the market. Indeed, I honestly believe that if some energetic American manufacturer ever puts in a two-high reversing mill with two stands of rolls, he will outstrip the present output of the three-high mill, for, while the plate is cooling to the required degree on the table of the finishing set of rolls he will give the next slab two or three more passes in the first set. To say that the British workman cannot be as active and energetic as the American workman, if it is his desire, is entirely wrong. I wish some of my American friends would visit some of your large steel works at about a quarter to six, night or morning, or at the change of the turn, to see them hustle to get out all they can before the whistle blows. Again, who are the majority of the iron and steel workers of America to-day? Europeans, or direct descendants of Europeans, and the majority of them from Great Britain.

Merchant Iron Mills.

Before touching directly on your merchant bar practice, both iron and steel, I will give you my opinion as to the principal cause of your falling behind. It is simply because up to the present time you have had no competition, and my remarks following will prove this. Look back at your record for the past ten years, as regards the manufacture of iron and steel. True, there has been a slight and steady increase; in fact, you have not fallen behind your own achievements, but have failed only to keep up with the achievements of others. How many new iron and steel plants have been started in Great Britain since the year 1890? Few of any importance, if any. How many millions of money have you spent during that time on improvements? I may be wrong, but I will venture to make the assertion that during the past ten years all of the British iron and steel manufacturers did not spend as much money on improvements as the Carnegie Steel Company did in two years. And why not? Has your right hand lost its cunning? Are your ingenuity and energy exhausted? You, who were at one time the greatest manufacturers of iron and steel in the world? I cannot believe it. It has been simply because you did not have to, could do well enough without. Who gave to the world the Bessemer, the Gilchrist and the Siemens processes? Great Britain. Who taught us how to make bar iron, wire rods, hoops, &c.? The British. Who gave us the continuous mill? Bedson, an Englishman. Who gave us what is known as the Garrett system of making wire rods? Great Britain and Belgium. Who gave us the best type of heating furnace for heating steel billets, which is now almost universally used in the United States and is almost a curiosity in Great Britain? Allen, an Englishman. Who gave us the idea of a successful reversing mill? Ramsbottom, an Englishman. I might go on indefinitely. Yet, having given us all this, we Americans have improved on them to such an extent that they can be scarcely recognized, and are to-day using them as a means to compete with you in the markets of the world. In the meantime, judging from some of your antiquated mills and methods, one would be led to believe that about 40 years ago a Joshua once more commanded the Sun of Progress to stand still, and that it has stood still ever since. And yet, when it was suggested to the management of some of these plants that by the introduction of some American methods a great saving in money could be made, the reply has been: "Why should I? I made over 30 per cent. on my capital invested last year and am satisfied with that." And at that same time they are rolling by hand ¾-inch round bars in about 16-foot lengths, making about 10 tons per turn, with one engine (which appeared to have been designed by Watt himself) driving four or five mills all as old as the hills, eight or ten shears, and I don't know what besides. Can any one admit that there is competition in a country where such conditions exist? To be able to pay dividends in this enlightened age under such conditions is a libel on progress, science, invention and ingenuity, and is an imposition and a grievous and unnecessary tax on the consumer. I may say here that all of your iron merchant mills are not like that, but this is no fancy dream sketch, nor is it the only mill of this type in Great Britain. While you have some first-class mills for making iron, the main fact that I wish to convey at the present time is that having rolling mills of this type paying dividends means that you have had little or no competition. One of the best guide mills in the States for rolling iron is what is called the Williams mill, located at Youngstown, Ohio. This mill consists of a 16-inch roughing train and a five-stand 10-inch train. On it there is rolled a box pile 5 inches wide and 6 inches high, containing over 60 per cent. scrap and less than 40 per cent. of muck bar top, bottom and sides. This is rolled into ¾-inch rounds in 100-foot lengths, and they make from 40 to 50 tons per turn. As I understood it you have very few mills of this type in Great Britain. In fact, even in the United States, this Belgian mill is not so popular as one might expect, considering the fact that it is able to take a large pile and roll it on a slow speed train when the pile is short and "dummy," and when the bar is long finish it on a train having a faster speed, which are the main features of the Belgian train.

Merchant Steel Mills.

As far as I can see you have not up to the present time taken steps in this country in the direction of building mills specially adapted for rolling merchant steel. In the United States during the past two years great attention has been paid to this. First of all it was found that the Allen type of furnace could be used for heating steel billets, whereas it was entirely unsuited for the purpose of heating an iron pile. The adoption of this type of furnace has reduced the labor cost of heating alone over 75 per cent., and it has been proven that in economy in fuel it is equal to the Siemens heating furnace. One of these furnaces can heat 135 tons of 4-inch billets in a single turn, and if the Laughlin patented arrangement for dropping the billets out of the furnace onto the conveyor is adopted in connection with same, only one heater, two helpers and a man to push the billets into the furnace are required to operate two furnaces, which have averaged over 200 tons per turn for a whole month. The total cost per ton for labor is about 12 cents or about 6 pence in English money. As this is the maximum output on rod mills it is but fair to state that when using the furnace for merchant mill purposes where the output is less this cost may be increased to 18 cents, or 9 pence per ton. Without the Laughlin "dropping out" arrangement this cost is about 25 per cent. more. When we realize that this type of furnace is of English origin and that any you may have in this country are looked upon as a curiosity, this is something to be greatly wondered at. This is one of the main agents in connection with the cheap production of wire rods and merchant steel.

Next we have continuous trains to do away with the hard roughing down. A 4-inch billet is rolled into, say,

¾-inch round, with only four men around the entire mill, who do all the work necessary to deliver the same onto the hot bed. This includes one man to look after the continuous train. Merchant mills of this type, starting with a 4-inch billet, have produced as high as 445 gross tons of 1⅛-inch finished square bars in 24 hours, and have produced over 8000 tons in a single month. The sizes rolled on these mills are flats from 3 to 1 inch wide of any thickness, and rounds and squares from 1¾ to ½ inch, and of course are best adapted for the middle range of sizes, as per the above. On another type of mill for making merchant steel they start with a billet 30 feet long on all occasions, and vary the size of same to suit the size of the finished bar. This billet ranges from 1½ to 3 inches square, and in some cases the bars are finished about 300 feet long. Too much credit cannot be bestowed upon the Morgan Construction Company of Worcester, Mass. (and, by the way, Mr. Edwards, a Welshman, or a direct descendant of that nationality, is the leading genius of that company), on account of the fine point of perfection these mills have been brought to. Their hot bed arrangement is a work of marvelous ingenuity. The best record I know of is 165 tons of 2½ x ½ inch, but the mill has a still greater capacity.

As to the merits and demerits of starting with a billet, say under 4 inches square, I will say that (outside of the fact that the capacity of the mill is controlled by the capacity of the furnace, as only one can be used) a 4-inch billet is sold in the open market in the United States for $1 per ton less than the smaller size billet. Now the total tonnage labor to roll a 4-inch billet into a finished bar is less than $1, and as it does not take more fuel to heat the same than is required to heat a smaller billet, it seems to me that merchant steel rolled from a 4-inch billet is delivered on the hot bed, so far as tonnage labor is concerned, at the same cost as the 1½-inch or smaller billet is delivered at the heating furnace. On mills of this type a merchant bar can be finished and placed on cars for less than 14 shillings per ton above the cost of the billet. This includes loss, fuel for power and heating and the cost of everything required to produce the same. When we come to the time when pig iron will be sold for $9 per ton again in the United States (which is equal to 37 shillings 6 pence) and 4-inch billets for $14 (equal to about 58 shillings), and when we add to this 14 shillings per ton for cost of conversion of merchant bars we have 72 shillings per ton as the net cost. Then not only Great Britain but also Europe will have what may be called competition. As you have so far made no effort in this country in the direction of putting in mills specially adapted to roll steel, I have nothing from which to draw a comparison except your present mills for rolling iron bars, on which you roll steel also, but I will say here that it is impossible to get up a mill having the same advantages as the American mill I have described to roll both iron and steel.

Hoop Mills.

If I were to be asked what I consider the finest rolling mill machinery in the world I would without the least hesitation say the continuous hoop mill at Youngstown, Ohio, designed and built by the Morgan Construction Company of Worcester, Mass. On this mill results are obtained which have been thought impossible and for nicety of adjustment and preciseness of relative speeds it is, in my opinion, the finest display of ingenuity in this line. This mill also has derived its main wonderful features, such as flying shears and coiling machine, from a Welsh engineer—viz., Mr. Edwards. Fancy a 1½-inch billet 30 feet long and weighing 225 pounds entering the first set of a continuous train and coming out of the last set ⅞ inch wide by No. 20 gauge. After the hoop comes from the rolls it is laid by a folding process on a slow moving table, and the only one to touch the hoop with a pair of tongs is a boy, who picks up the first end and enters it into the reel, which coils the hoop up as neatly as a ribbon. The hoop is afterward cut automatically in the required lengths for cotton ties. The output of this mill is about 45 gross tons of ⅞ inch by No. 20 gauge hoops, single turn. It is impossible for tongue or pen to describe this remarkable rolling mill machine. However, mainly owing to the impossibility of obtaining a uniform size throughout the entire hoop when finished, this mill has not met with the favor one would expect. For cotton ties or hoops which do not require to be of an exact gauge throughout it may be all right. Be this as it may, the fact is the American Steel Hoop Company or their predecessors have built two hoop mills since this continuous hoop mill was built, and neither of them is of the continuous type throughout. The most popular type of hoop mills are those having a continuous roughing and looping finishing train of four sets of rolls, on which it is a common thing to make 45 tons in a single turn of 1¾ inches and 1½ inches by 18 or 19 gauge, or about 30 tons per turn of ⅞ inch by 20 gauge cotton ties. As to how much better these results are than those obtained in Great Britain I will leave you to judge. From what I understand and have seen you still have the old style hoop mills of 10 or 15 years ago, and where your practice is most lacking is in the means to take care of the hoop as it comes from the last set of rolls. It is no trick on a first-class hoop mill in the States to roll 1½ inches by No. 19 gauge in 200-foot lengths and the piece runs out the entire length without being touched. Then again, you roll iron and steel hoops on the same mill, which prevents the adoption of certain improvements in particular in connection with the heating of the billets.

Mills for Rolling Strips for Tubes or Skelp.

In regard to strips, the finest mill we have in the United States for this purpose is a three-high universal mill, built by the Garrison Foundry Company of Pittsburgh, Pa., for the Lukens Iron & Steel Company, on which mill they roll from 10 to 36 inches in width. They have but the one set of rolls three-high. I understand that this mill is giving very good results, but the manufacture of this class of material, strange to say, has not been developed to any extent even in the United States. One reason for this is that it is but lately that the consumer has become reconciled to the use of steel pipe, the material for which alone will permit of any extensive and marked improvement in the method of manufacture, However, with what we have our practice is far ahead of yours in this country. On an ordinary 10-inch train over 60 tons of 4¼ x 10 inch strips have been produced in a single turn, and between 60 and 70 tons of from 6 to 10 inch strips per turn is a common thing on a 16-inch mill. This refers to steel strips. I understand that in Great Britain you pay double the price for rolling strips which you pay for bar iron, whereas in the United States we pay less than for rolling bar iron. Special rates are allowed the manufacturer by the Amalgamated Association to pay men rolling strips. This is no doubt owing to the fact that at one time nothing but cut nails were used in the United States, of which over 6,000,000 kegs were made in a year, calling for over 300,000 tons of 12 to 14 inch strips. This made the rolling of strips so familiar and common and competition became so keen between the cut and wire nail that reduction after reduction took place, which was naturally felt by the strip and skelp makers and most of those nail plate mills, as they were called, are rolling strips to-day. As the methods of rolling strips are about the same in both countries I will close the subject by making the prediction that within the next five years more improvements will be made in the direction of improving the present method of making strips than in connection with any other process in the steel business, as the demand for the same is growing greater every day and a production of from 250 to 300 tons of strips per turn, varying from 10 to 22 inches wide, will be a common occurrence.

Wire Rod Mills.

I touch upon the subject of wire rod mill practice last of all, because the striking developments and results by the American rod mills speak for themselves, therefore I will not take up your time with this at present, but will refer you to an article published in *The Iron Age*, issue of February 22, 1901; to another article on the history of the 4-inch billet, published in the *Iron and Coal Trades Review*, issue of March 8, 1901, and to the address of Chas. H. Morgan before the 1900 meeting of the Society of Mechanical Engineers, which gives the Morgan Construction Company due credit in a very modest way for all they have done to improve rolling mill practice. I

will merely add that there are two well defined types of wire rod mill in use in the United States—viz., the straight continuous and the improved Belgian types, the latter commonly called the Garrett mill. Judging the popularity of both these types of wire rod mill from the number of each in use, the continuous mill, were it not for the mills of this type in operation at the works of the Washburn & Moen Company (now belonging to the American Steel & Wire Company) at Worcester, Mass, and at Waukegan, Ill., which of late have been perfected by F. H. Daniels, chief engineer of the American Steel & Wire Company, to such an extent as to become quite a formidable rival to the looping type, the continuous mill would cut but very little figure. Indeed, it is only justice to say that Mr. Daniels is the only one who ever designed and constructed a continuous wire rod mill that could successfully roll more than one rod at the same time, and his last effort, in the wire rod mill at Waukegan, Ill., is a masterpiece in that line. This mill starts with a 4-inch billet, and its output is nearly equal to that of the best looping mills, about 350 tons to the double turn, whereas the Morgan continuous mills, starting with a 1¾-inch billet, produce about 150 tons per double turn.

I will now proceed to express my views on the rod mills of Great Britain. I understand that at Middlesbrough you have a straight, continuous rod mill which has been in operation for some time. For some reason or other recently when another mill was put in the Belgian type was selected. Richard Johnson & Nephew of Manchester have a rod mill partly of the continuous and partly of the looping system. They, through Bedson, were the pioneers of the continuous mill, but have changed from the straight continuous mill to part Belgian. The roughing train is continuous and has vertical rolls in all cases, to reduce the ovals to a square. This is the finest mill of its kind in the world, and the manner in which these vertical rolls are driven shows remarkable engineering skill. But why have vertical rolls, which prevents you from rolling more than one bar at a time, when the "twist" guide will do the work just as well, and you could have all of your rolls horizontal? You have a four-high mill at Warrington which is much more complicated than a good Belgian mill. On this mill the bar, when it is square in cross section, is carried by means of what we might term a split pipe from the top two-high set to the bottom two-high set, the latter set being speeded up in proportion to the reduction. As this is accomplished by a curved guide on all Belgian trains, which saves the same labor and has no complication, and the output of some of the Belgian mills in Germany exceeds this mill, this seems another case of "much ado about nothing." Then you have some of the very oldest types of rod mills in Europe, and to show how far you are behind in output at least I will make the assertion that the four best rod mills in Great Britain, during the month of January, did not produce as many rods as one of the wire rod mills in the United States, which, during that month, produced 10,230 gross tons of No. 5 rods. Indeed, I might make it five of your best mills and be safe. Here we have five different concerns, five mills, five crews of men, five rollers (skilled men) and five heaters (skilled men). You pay the rollers, say, 25 shillings per day each, or £6 5s., and the heaters 15 shillings per day each, or 75 shillings, making a total of £10 for each turn's work, instead of one roller £2 10s. and one heater 25 shillings, or a total of £3 15s., or over 75 per cent. less, not to speak of the balance of the men. I wish it to be understood that in my opinion the best men around the rod mills I ever saw are those who work on your present mills in England, so it is not the fault of the men. The question might be asked: "If each of these five rod mill owners had a rod mill of that capacity what would they do with such a proportion of rods?" This I do not know, but if the present method of making rods is persisted in the time will soon come when you will not make any rods, as there is already quite a surplus of rods in the United States, and when your steel makers find some means of giving you a cheaper 2-inch billet, to meet which price the American steel makers may not find it to their advantage, then they will deliver wire rods to England at a figure less than you are now paying for 2-inch billets. Is there no remedy and will Great Britain give up the wire business? She, who was the mother of that business and has taught the world how to make wire. I think not and believe that there is a remedy which will eventually be adopted. Supposing the five largest users of wire rods in Great Britain were to combine and erect a large first-class rod mill, but keep their business just as it is, and each party took stock in the new rod mill deal in proportion to the amount of rods they would use. They could treat this new enterprise as an entirely new organization from their present wire drawing plants and locate the new plant not far from a shipping port on either the East or West coast. Then let us see how they would stand with a view to securing their raw material in the shape of billets. So far as their supply from Great Britain is concerned conditions would be the same as to-day, but they could not only get their billets from the Pittsburgh district, as they are doing at the present time, but could also draw their supply from the Tennessee Coal, Iron & Railroad Company of Birmingham, Ala., who are located but a short distance from the seaboard; from the Maryland Steel Company of Sparrow's Point, Md., and from the Dominion Iron & Steel Company, whose plant is located at Sydney, N. S., or 1000 miles nearer Liverpool than New York is. No better source for a supply of billets could be had. When keen competition comes the Dominion Iron & Steel Company, who can make the cheapest pig iron in the world, will always be able to make steel billets at a low cost. This same scheme can be applied to all who now make rivets, bolts, &c., or those who make tubes or pipe, getting soft steel billets to make their strips. In fact, if your raw material, such as ore and coal, is becoming scarce and you can find a better market for your coal by selling it for steam purposes than by disposing of it to manufacturers of pig iron or steel, who, during times of competition, must have cheap coal, I can see no better scheme. Why import ore, which has 50 per cent. of foreign matter, when you can import billets on which there is but from 5 to 6 per cent. loss from the billet to the wire rod, merchant or steel strip? This same rule can be applied to those who use strips or tubes, and not only that; if the British iron and steel makers do not follow the footsteps of their American cousins and combine and then only manufacture their respective material at the most advantageous points of shipment and use the most economical method of manufacturing, the manufacture of iron and steel in time will become a lost art in Great Britain.

The Bessemer Coke Company.—The Bessemer Coke Company, Lewis Building, Pittsburgh, have further enlarged their holdings by the purchase of the Columbia Coke Company, which latter concern own some very valuable coal lands in the new Klondike district of the Connellsville coke region, with a plant of 100 ovens. The Bessemer Coke Company began business only about four years ago, with its Humphreys plant of 100 ovens, but have steadily pushed to the front, first by buying the Duquesne Coal & Coke Company, then the Empire Coke Company, and later building their Griffin Works, until now, by the acquisition of the Columbia Coke property, the Bessemer Coke Company become the second largest independent manufacturers of coke in the Connellsville region, owning outright five mines and 770 ovens, and operating in all 1000 ovens, with a capacity of over 600,000 tons of coke per year.

Owing to the fact that orders have gone forth to abandon the Pennsylvania Canal, many large industries and manufacturing concerns who have been getting their water power from this source will be forced to seek power elsewhere and also other sources of supply. For years the Pennsylvania Canal Company have supplied the Pennsylvania Steel Company with water for the large plant at Steelton, but the steel company are now arranging to erect a water plant along the river near the works. An expert was at Harrisburg recently to look into the matter and make report.

The Burnham Drill Presses.

Two new tools, built by the George Burnham Company of Worcester, Mass., are here illustrated. Only one belt is needed to drive each spindle of the two-spindle sensitive drill, and that a straight, open belt. This feature is obtained by a pair of bevel gears, one of which is a fiber gear, so there is not any noise from the gears. These gears drive the upright shafts with the cone pulleys on top, then a 1½-inch belt drives the spindles. The tension of the belt is never on the spindle. The quill has a steel rack and pinion. The spindle is made of crucible steel, and is reamed with Morse Taper No. 1. The spindles are counterbalanced with a coil spring, which can be adjusted to any degree of sensitiveness. The spindles are 10 inches apart, and have an adjustment on the slide of 12 inches. The table is counterbalanced by a weight inside of the column. The table is provided with oil channel, and is free to swing either way.

The main dimensions are: Size of spindles, ⅞ inch; vertical run of spindles, 4 inches; vertical run of table, 32 inches; greatest distance from spindles to table, 36 inches; size of table, 12 x 24 inches; diameter of column, 4½ inches; will drill to center of 16 inches; size of tight and loose pulleys, 8 inch, 3-inch face; size of cone steps, 3½, 5⅛, 6⅞ and 11½ inch belt; size of base, 25 inches; total hight of drill, 70 inches; weight, 520 pounds.

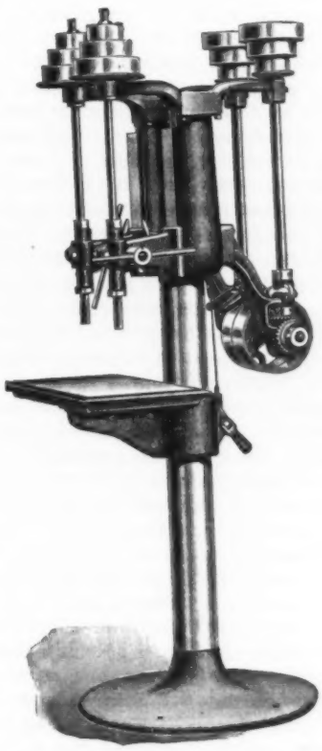


Fig. 1.—Two Spindles.

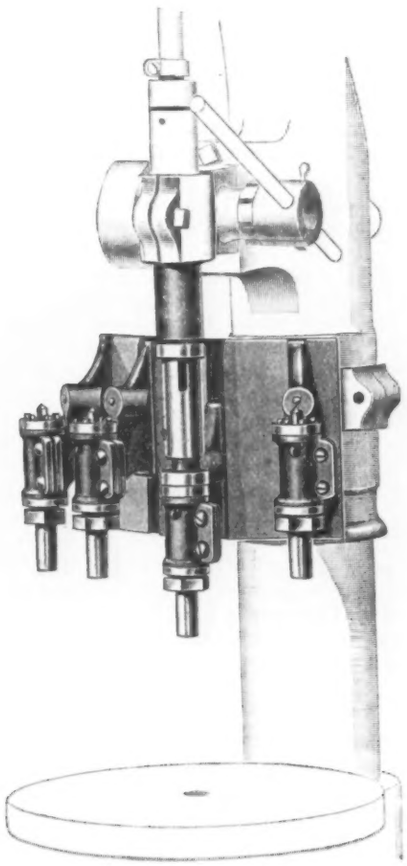


Fig. 2.—Turret for 13-Inch Drill.

THE BURNHAM DRILL PRESSES.

Turret for 13-inch Drill.

The turret shown in Fig. 2 swings round the column of the drill, same as the table. The turret can be turned one side and the machine used as a single spindle drill. The heads are held up in their usual position by a pin and spring. When the drill spindle is brought down it connects with the head under the drill spindle, and as the spindle goes down it unlocks the head from the cylinder and at the same time locks the head to the driver in the drill spindle and remains locked until the drill spindle is carried back to its usual position, when it unlocks of itself and locks into the cylinder. The cylinder is turned by a slight touch and the next head will stop exactly under the drill spindle. When one of the heads is locked to the drill spindle it really becomes a part of that spindle, and very little, if any, strain comes on the slides in the cylinder. The spindle in each head is ¾ inch diameter, 2¼ inches long. The ends of spindles can be fitted to universal chuck, or bored out for straight or taper shank drill.

The Oliver Mining Company.—The directors of the Oliver Mining Company, the Lake Superior Iron Company, and the Regent Iron Company, component properties of the United States Steel Corporation, have received and accepted the resignations of Henry W. Oliver, president, and D. G. Kerr, vice-president of the three companies. T. F. Cole, general superintendent of the Oliver Iron Mining Company, was elected to succeed Mr. Oliver as president in all the companies, with the additional title of general manager. Nelson P. Hulst was likewise elected vice-president and general mining engineer. Both officers will have headquarters in Duluth, Minn. These changes are incident to the general reorganization of the executive staffs of the various companies controlled by the United States Steel Corporation.

The St. Clair Ice Blockade.—The raising of the ice blockade in the St. Clair River on the 8th inst. marks the latest opening of navigation on the great lakes in the present generation. At least 200 ships were in waiting for the end of the blockade. That the end came without serious marine disasters was a surprise to vesselmen. The ice jam had blocked navigation from the upper lakes for 22 days. Usually the opening of the Straits of Mackinac between Lakes Michigan and Huron and of the Sault Ste. Marie canal, between Lakes Superior and Huron, marks the passage of the closed season. This year persistent north winds drove a great accumulation of ice from Lake Huron south into the St. Clair River, which caused an unexpected blockade.

President Schwab Before the Industrial Commission

WASHINGTON, D. C., May 14, 1901.—President Charles M. Schwab of the United States Steel Corporation testified at length before the Industrial Commission on the 11th inst., concerning the business conditions in the steel trade in general and the plans and prospects of the big merger in particular. In discussing the industry and its recent development he spoke with the utmost freedom, and frankness quite unexpected by the Commissioners marked his replies to leading questions concerning the intentions of the managers of the great consolidation. He defended the capitalization of the merger on the ground that its supplies of ores, coal, &c., were of enormous value; he predicted that there would be no advance in prices, but, on the contrary, a decline, unless there should be unforeseen developments adding materially to the cost of production. He asserted that the tariff, while unnecessary for the protection of those products of favorably located plants in which the labor cost was a small factor, was essential with reference to highly manufactured goods and especially to manufacturers with limited resources. On the subject of the manner in which the United States Steel Corporation were promoted and financed Mr. Schwab's replies were diplomatic and at times jocular; and, in fact, throughout his testimony he frequently turned a pointed inquiry with a witticism which served the purpose of silencing his questioner. Mr. Schwab's appearance before the Commission served to attract a large audience made up chiefly of prominent lawyers, Government officials, &c.

In beginning his testimony Mr. Schwab fortified himself by asking the indulgence of the Commission with reference to his replies to questions pertaining to the United States Steel Corporation on the ground that it was "so new—really unorganized—only in the process of formation." He said, however, that he would give such facts as he could, and with regard to the industry before the organization he would be glad to speak freely. At the request of Professor Jenks, the trust expert of the Commission, who conducted the inquiry, he sketched briefly the status of the Carnegie Company prior to the consolidation.

The Carnegie Company.

"The Carnegie Company," said he, "were large miners of iron ore, producing practically all the ore they required themselves to the extent of nearly 6,000,000 tons per annum. They transported a large percentage of it in their own boats over the lakes; they carried a very large percentage over their own railroads to their Pittsburgh works, and manufactured it there by various processes into a great variety of iron and steel articles; I think, perhaps, a larger variety of steel articles than almost any other manufacturing concern. That is, we made nearly everything pertaining to the iron and steel business, including rails, billets, armor and many other lines. We did not mine ore to sell to other manufacturers because we did not care to. We were owners of such a large percentage of what is known as old range ores that we felt we should preserve it for our own use as being a most valuable asset. Roughly speaking, I should say we mined about 25 or 30 per cent. of the ore production of the country, and in finished products our output was relatively the same—that is, about 25 or 30 per cent. on the average, but much more than that in certain lines. In structural materials of all descriptions, including plates, &c., we made 50 per cent.; in rails, about 30 per cent., and in armor about one-half.

"As to our transportation interests, we had 18 ore carrying boats, with 10 or 12 more under course of construction at the time of the consolidation; but we really contracted the largest part of our ore shipment through other interests; the Lake Superior Consolidated Mining Company and the Bessemer Steamship Company carried a great deal of our ores under long time contracts. We also owned a railroad known as the Pittsburgh, Bessemer & Lake Erie road, running from Conneaut Harbor to the works in Pittsburgh, about 150 miles; a new road especially designed for heavy traffic; although we carried passengers and general freight and took local business, the bulk, of course, was Carnegie business."

Replying to a question as to whether the Carnegie Company were a combination of different establishments, Mr. Schwab said that the original company were a partnership, but when they went into the mining of ores they formed a separate organization for that purpose and followed a similar plan with regard to almost every other branch of their business.

"Their shipping industry on the lakes," he said, "was a separate organization; so also their railroads, their coke interests, their limestone interests. All these various companies, numbering some 26 or 27, were separate organizations, but the controlling interest in each was held by the Carnegie people; in fact, Mr. Carnegie himself retained a controlling interest in all, or something over 50 per cent. in each of the corporations. It was then found that this partnership had grown so large and the business was of such a varied character, with so many companies to control and so many partnerships holding varied interests, that for the sake of harmony among our partners it was decided to put all branches into the control of one corporation to be known as the Carnegie Company. One of the chief reasons for that was it was Mr. Carnegie's idea that a partner in the coke interest, for example, should not have a greater interest in coke than he had in steel, as it might affect the contracts between the two companies; or that a partner should not have a greater interest in shipping than he had in steel making. Therefore he put it all in one company, so that each partner's interest was in the whole enterprise, Mr. Carnegie retaining control of the company just as he had of the individual companies. Our stock was never listed, and the idea in making the company was that it should be retained as nearly as possible like the close partnership. We made the shares $1000 each in order that they might not be traded in, and we took such precautions that I believe during the existence of the company there was only one sale of ten shares of stock. It was practically a partnership continued."

In speaking of the advantages accruing from bringing together different interests under one central management in the steel industry, Mr. Schwab said:

"I do not know whether it has occurred to you that in the formation of this company—the United States Steel Corporation—it has not been the rule to put together companies in exactly the same line of business. You will notice that the tube manufacture was in no way connected with the others, and so with the tin plate, the wire, and the hoop. It is true that the Carnegie Company were unique in their position of being largely makers of structural iron, which the others did not make. The billets that were made by the National and Carnegie and other companies were consumed by the constituent companies, so they were hardly competitors in that line. In rails, however, they were competitors, but it would have been impossible to put these great companies together without having had them as competitors in some lines previous to the organization.

The Advantages of Controlled Ore Supply.

"The great advantages which the new company enjoy start with the ore, embracing the well-known ranges in the Northwest, from which all the constituent companies derived their supply, and 80 per cent. of which the United States Steel Corporation own or control. No ores have been acquired since the formation of these companies. Now, these ores as owned by individual companies were often of such a character as not to produce the best results. One company, for example, may have owned Mesaba ores, while another may have

owned old range ores, but the consolidation of all these ore interests has enabled these companies to utilize all of the ores to the best advantage by distributing them in the best manner possible; that is one of the greatest advantages resulting from this consolidation."

"Do the United States Steel Corporation actually own these properties?" asked Professor Jenks.

"No," replied Mr. Schwab, "they simply own the stock of the individual companies, which they control by reason of this ownership. The man in charge of each company is responsible for the profits of his company, but the United States Steel Company have no control except through the election of directors each year. For example, if we elect a directorate for the National, we do it as holders of the majority of the stock of that company at the annual election, and we would naturally take care to put in directors who would be in sympathy with the United States Steel Corporation; but if those directors should disregard our policy there would be nothing in the world to prevent them from carrying out their own ideas."

"Until next year," suggested Professor Jenks.

"Until next year," assented the witness with a smile.

"I regard this question of ores," said the witness, returning to that phase of the subject, "as a most important one, and I wish to make the facts very clear to you gentlemen. The Illinois Steel Company owned in the northwest of Minnesota some excellent ores, some of which they were in the habit of selling to buy other ores at about the same price, which would enable them to make a better mixture. The Carnegie Company were in a similar position, and as every manufacturer realizes the great importance of mixing ores, so with the consolidation of interests we can get absolute perfection in the matter of mixture for the purpose of the most economic manufacture.

The Transportation of Ore.

"Now, to go on down in the development of other advantages, we come to the question of transportation. When six, ten or twelve individual companies each owned their own fleet ores were never carried in the most economic manner. When a certain boat reached the dock it would have to wait considerable time in order to get a certain amount of a certain ore, and other boats would be held back. Now, owning the entire fleet, we have about 115 of these boats, and they move continuously and rapidly; it makes no difference what ore is ready, the boat loads that ore and goes out without delay, and after it gets well down the lakes the manager decides what dock to send it to, and it goes there at once; so there is never any delay in handling shipping facilities. This is a very great advantage, but one that is hard to appreciate unless you have been practically in the transportation business, and then you realize how important is facility or dispatch in carrying it on.

"Another very great advantage is this: We are able to distribute when we get to the other end of the lakes over the docks and over various railroads to the various works much more satisfactorily than if each company were individually doing it, and the same argument that applies to water shipment applies to railroads. When it comes to the question of manufacture we can always arrange so that the works best adapted by reason of their location to the furnishing of certain articles can do so. As an illustration—for there is nothing to conceal in this business—the National Steel Company have been making rails at Youngstown, but the Federal Steel Company are better located, and the Lorain Steel Company, by reason of their proximity to the ores, for the production of rails, and one of the first things we did was to put those works entirely on rails and the other commodities best suited, thereby saving the freight and delays in shipment and delivery.

Skilled Employees.

"The saving in the cost of superintendence is a very important item. As yet we are in the process of formation with reference to this matter, and therefore I cannot speak as to specific instances, but the direction can be very much simplified and very much cheapened by reason of the fact that skilled men can be employed to the best advantage. The industry is peculiar in this that no matter how small the operations are certain skilled men in each line are necessary. If a firm have two furnaces or 50 furnaces, they can't do without one skilled man in each line, as a melter, a superintendent, a chemist, a draftsman, and so on down the line. Now we consolidate all these industries and we can appoint one selling man, for instance, one chief chemist, one chief engineer, &c., who will answer all the purposes for all these works, by adopting the same methods at each. Not only can we do that, but we can take the best man from each of all the works, and give their services to the other works, thereby effecting a great saving, because the steel business is one in which experiment and development are constantly required to produce improvements. From year to year new processes and new methods have to be adopted, and where you can take advantage of the experiments of an individual plant and apply it to all the others you reap a great advantage."

"Do you not find," asked Professor Jenks, "that in your consolidation some of the plants are so poorly situated or equipped that it is advisable to close them down?"

"I can only say," replied the witness, "that we are running them all very full now."

Saving in Selling.

Recurring to the subject of economies, Mr. Schwab continued: "As a further illustration, take the selling department. In New York there were eight or ten selling offices, each of which had its leased wires, its telephones, its operators, &c., and the consolidation of these offices into one building under one head will make great savings in all directions."

Replying to a question as to whether the officers of the constituent companies would be more or less changed in the immediate future, Mr. Schwab said that the organization would not be materially modified, but there would probably be a good many changes in *personnel*. "They will not be changed immediately," said Mr. Schwab, "but as time goes on my idea is that the best results will be attained by having the control of each company in the hands of the president and his chief assistants, and that there will not be so many names on the boards of the constituent companies as heretofore."

"From your experience with the Carnegie Company, or from what you have observed of the United States Steel Corporation, can you see any disadvantages accruing from consolidation?"

"There are none that I know of that I could speak of definitely," replied the witness after a thoughtful pause.

"The suggestion has been made that there was likely to be a less active interest in the conduct of the works on the part of superintendents if they were merely employees and not owners?"

"That is not true," replied Mr. Schwab, with emphasis. "If the superintendence is carried on in the manner I expect it will be, and as we carried it on in the Carnegie Company, there will be no lack of interest. Every superintendent in the Carnegie Company was individually interested in the profits of his company, or in the cost, or in some other way than through his salary. The interest varied; sometimes a superintendent was paid on a percentage basis as to his profits or output or quality, whichever was most important for us to develop in that particularly territory. I think that system generally was a good one, and I hope that results will soon prove it is the right one for the United States Steel Corporation.

"Another point. Detailed reports are very necessary, and in the Carnegie Company we get a detailed report every month of the cost of operation in every department of every article manufactured. My belief is and always has been that greater economies are effected by strict supervision over all departments than in any other direction, and we develop that to the utmost in all our plants. We required very careful comparative statements of costs in each department, and had our managers make such explanations as were necessary whether the results were good or bad."

Professor Jenks then asked the witness to detail at some length the form of the organization of the United States Steel Corporation with special reference to the manner in which it was brought about.

"I do not want," replied Mr. Schwab, "to speak specifically about that of which others have accurate knowledge. I think, perhaps, the individual members of this Commission know pretty nearly as much about that as I do. The United States Steel Corporation were organized in the same method as the Federal Steel Company, of whose organization you have had pretty full evidence here. The lines followed were almost identical. In making up the working force of the organization I was careful to put in no controlling officers, no directing officers, my idea being to make the organization of each subsidiary company as strong within itself as possible; to throw the whole responsibility for the results and the manufacture upon the subsidiary organizations, and if you will note the organization of those companies in the future, I think you will find that basis has governed.

A Clearing House for Information.

"The United States Steel Corporation will endeavor to make themselves largely a clearing house of information from which the presidents of the subsidiary companies can get the information that they desire with reference to the other companies and from that be able to define the best methods they should pursue. Purchases will be made by each company separately, and sales will be effected by each company except in one particular. There are instances where the same lines are sold by different companies, like rails, for example, and it is probable that the companies making the same line will appoint the same sales agent in the same location in that line. But the companies making wire, for example, or tubes or tin plate, will maintain their own organization for selling. Now to make clear to you how little the United States Steel Corporation wish to direct, I might cite the fact that the presidents of the Federal Steel Company, the National Steel Company and the Carnegie Steel Company recently held a conference to decide how to manage the sales of those companies to the best advantage of each company, and with the least cost. I did not attend their meeting at all, but they agreed upon their own methods with reference to the sales of their agents, &c., and proceeded on that basis. Of course, I do not mean to say that all the officers of these subsidiary companies are not in sympathy with the general policy that might be established by the United States Steel Corporation. That is the idea in being the holders of this stock—in order that we may elect officers and directors who will be in sympathy with our policy, but when once elected they are responsible for that business and conduct it independently. One of the chief difficulties I have experienced already is in the interchange of business. Each company are so interested in their own business that each want to drive a hard bargain with the other."

"Will you furnish for our file a copy of the articles of association and by-laws and the syndicate agreement?"

"I will not say that I will furnish that data. That is a private agreement between the syndicate and us personally, and though I will make inquiry and advise you, I cannot promise to give it to you."

The Corporation and Prices.

In answer to an inquiry as to whether the economies which would be enjoyed by the United States Steel Corporation had been reflected in prices, Mr. Schwab said:

"The prices have remained the same. I think the tendency will be to have somewhat lower prices, and I do not think there is any probability of increased prices unless there should be an unusual condition to warrant it—I mean not to warrant a voluntary advance of prices, but a change in costs to make higher prices necessary."

Professor Jenks asked whether it was not true that the constituent companies, being themselves consolidations of smaller companies, had reaped some of the advantages spoken of by the witness, in spite of which prices within the past two or three years had been very high.

"I should say," said Mr. Schwab, "that there has been a peculiar condition since those companies were organized, and I think prices have been largely regulated as a question of supply and demand. For example, just about a year ago, certain lines of steel sold at the lowest price in the history of the American steel industry. Six months prior to that in certain lines the prices were the highest within my recollection, which would seem to indicate that it was largely a question of supply and demand. I think I can safely say that the tendency of these organizations has been to keep prices moderate, not too high, and to promote consumption. If prices went too high consumption dropped off. These great companies are interested in seeing all their works running full, and they endeavor to keep prices on such a basis as will keep them running full."

When asked as to whether products were not frequently sold abroad at lower rates than prevailed in the United States Mr. Schwab said it was true, and the practice was necessary.

Export Prices and Domestic Markets.

"Export prices," said he, "are made at a very much lower rate than those for domestic consumption, but there is no one who has been a manufacturer for any length of time who will not tell you that the reason he made those prices even at a loss was to run his works full and steady. That has been the chief consideration governing all these companies in their export business. In very busy times like these export business is comparatively light, because we have been able to run full on domestic orders, and is maintained more for the purpose of keeping in the foreign markets than for any other reason. When we have as much as we can do at home, as we have to-day, we are not anxious to sell at low foreign prices, but when our mills are not running steadily we will take anything at any price, even if there is some loss in so doing, in order to keep running."

"Would that statement apply on foreign contracts made for some months ahead?"

"Well, this is an illustration in point: Last year about this time, when we had our great dropping off in demand for steel, very heavy tonnages were made for export at very low prices—I think probably as low prices as were ever made—because American manufacturers felt that we were going to have a protracted period of dull business here, and they were justified in taking the risk, and hence we did—I did personally. I contracted for a great deal of steel to be shipped abroad, which in view of the great demand that immediately followed we were almost unable to make, and yet that was one of the risks that the business man has to take to insure his works running full. We would rather take the insurance at a loss of running our works full than to take the risk."

"Can you afford to carry on business at the prices you get on your exports and pay the rates of wages that you do?"

"Nothing like it, nothing like it. I think you can safely say this, that where a large export business is done nearly all the people from whom supplies are bought for that purpose give you a good price for the materials that go into the exports; the railroads will carry them a little cheaper and so on down the line, but labor, within my knowledge at least, has never been asked to work for a lower price for export material, so that labor benefits more by it than almost any other factor in the transaction.

"The business reason for selling for export at a lower price is to gain the foreign market, and at the present time we have to sell low abroad to keep the market. Any one who has ever tried exports will realize the difficulties of the business, and once developed you certainly do not want to throw it away. I do not want to say that I do not believe that this country is in a position by reason of its raw material and its superior facilities for manufacture to do a great export business at a profit, but I do not believe it will be sufficiently profitable to justify the manufacturing methods and especially the wages now prevailing in the home business. What is true of the iron and steel business is true of every other; exporters must take less for their goods

than they receive at home, and that is only natural. If a man comes here to sell you goods from England they may be of the same class and quality, but you will give preference to your home manufacturer, so if you undertake to export goods you must make them attractive in quality and price. In this connection, however, I want to say that American steel has been sold in the American market at as low prices in times of extreme depression as in foreign markets, but it has been sold without a profit, for we have been compelled to run for a space of time at a loss."

When asked what percentage of the product of the constituent companies of the United States Steel Corporation was exported during the past year, Mr. Schwab said he had not as yet compiled the figures. The Carnegie Company, he said, exported about 70 per cent. of all the steel exported, but he could not state the number of tons offhand. He would, however, furnish the figures at a later date. Replying to a question as to the percentage of the steel industry controlled by the United States Steel Corporation, he said it probably ranged from 65 to 75 per cent., varying with the times. In prosperous times the percentage would be smaller, and in very dull times it would be very much larger. He did not think that the control of 75 per cent. of any industry could be called a monopoly, and when asked whether it would enable a corporation to fix their prices absolutely, he said:

"I do not think so. Prices are fixed naturally in times of great demand whether there is a consolidation or not. Even in times of great depression the chances are that when we take anything like 70 per cent. of the business we would be unable to fix the prices. Of course, you can get better prices when the demand is such as to enable everybody to run full."

The Rivalry Among the Works.

With regard to the possible reduction in prices likely to result from the new consolidation, Mr. Schwab said:

"There is another great advantage which we enjoy that I would like to have you familiar with. There has been tremendous expenditure in making use of these properties that will probably be much curtailed under the new organization. There will be no necessity for ten concerns starting into the manufacture of rails, for example; you can put part of that expenditure into improvements and additions to two or three of those plants; and therefore, instead of extending the plants in a great variety of lines, they will be specialized and extended rapidly along those special lines, which will be a very great advantage.

"I calculate that the rivalry between the various works will be a great advantage. I made it a practice at our works to utilize this spirit of emulation. Now, most managers, if they had three open hearth departments, for example, would put them under management of one good man. I never did. I put one good man at each of them, and then I rivaled one against the other, and in that way got better results. This consolidation of interests will do the same thing. It will put one works as a rival against another works as to practices, wastes, supplies and everything that goes into costs, and in that way get the best result obtainable. That is one of the advantages of co-operation."

The Protective Tariff.

"Do you think the protective tariff on steel is any longer desirable?"

"I do, especially in certain lines. You take the lines of steel manufacture in which labor forms the largest part of cost and you have got to have a protective tariff or reduce your labor. Now on lines of steel in which labor does not form an important part it is perhaps safe to say that we have reached a point where we do not need the tariff. Now, let us take the question of billets, for example. The cost of billets over pig iron or over ore as far as labor is concerned is very slight. But you take the case of rails or tin plate, and the highly finished articles in which labor forms a very important element of cost, and if you remove the tariff you either lose the trade or you reduce your labor. That is a very simple proposition to me. Now, what do we export? We are not exporting tin plate to-day. Why? Because we have not the advantages of manufacture. Our labor is too highly paid. But we do export largely rails and billets because labor does not form an important factor in their production."

"How about the skill of the American workman as compared with the European?"

"Well, there is something rather remarkable about that. You have seen in most discussions of this question the statement that Americans have been able to export largely by reason of their superior facilities for manufacturing and the greater skill of their labor, but if you will stop to think of it the large exportations have been in those lines in which labor has not played an important part, like rails, billets and things of that sort."

"Could the tariff be taken off rails without serious injury to your business?" asked Commissioner Conger.

"It could in the Eastern States, but as long as rails can be shipped to California as ballast, and the interests of the railroads by which we must ship overland require that the rate of freight for us shall be higher than it is from England, the loss of the tariff would be felt. I might say, however, that with reference to the great bulk of our rail business the rail is in the same class with billets."

"If the tariff on rails were removed," asked Professor Jenks, "would it not lead to the establishment on the Pacific Coast, and possibly in some of the Gulf States, of some of your plants, so that you could supply remote sections by water?"

"I think not; because to transport 3 or 4 tons of raw material to such a plant to make 1 ton of finished product would more than counterbalance the difference in freight."

"What would you say as to the tariff on your raw materials—on coal, for example?"

"I would rather not speak of that. I have not studied it. We are not sellers of coal, and we are no further interested than supplying our own companies that have not any. We buy some coal, but as a broad principle we supply ourselves in all lines of our raw material. This is not entirely so, as some of our subsidiary companies, not having their own mines, have heretofore been required to buy coal, and hence we are purchasers of coal for some of the companies, but hereafter we want to supply them from our own mines."

"Would you say that the United States Steel Corporation, owning all their ores, should in their bookkeeping assume higher prices for ore when there is a strong demand for the finished product?"

"Not necessarily; but it is perfectly fair. There are some supplies which we must necessarily find outside. There is the matter of tin for tin plate, the materials used in the galvanizing of wire and tubes, nickel for the making of armor plate, and other things which have an influence on cost, and hence the price of our finished product is determined to a considerable extent by the prices of the raw material. But as to ore this is fair: There is a known quantity of ores in the United States, and as far as the best geologists can determine this ore region is not likely to be extended. Now, I think it is perfectly fair for the United States Steel Corporation, in view of this fact and knowing that they own a given tonnage of ore which can be very closely estimated, to fix a liberal price upon that ore because in years to come it is going to be very valuable, exceedingly valuable."

Fixing the Price of Ore.

"Would you vary the price of the ore with the demand for your finished products?"

"No, we would not. We might charge it in for the purpose of reducing our profits. We ought to fix the price that we think the ore is worth. That is the basis of it all. If we fix a price for ores it ought to be maintained under all conditions, and then, whether we take our profit on the ore and lose it on the steel, it would not make any difference. But the value of these plants has been much underestimated by people who cannot appreciate the limited quantity of raw material that is available in the United States, or the world for that matter, for the manufacture of steel. For example, England thought years ago that she had an unlimited

supply of raw material, and her manufacturers went ahead using it. To-day the manufacture of steel in England is largely a question of procuring raw material. They did not place nearly a high enough estimate on the value of materials which they had in England and now they are going to Spain and Sweden and even taking some ores from America. That ought to show the value of the ore deposits which we have in America; and I am constantly talking to our people about putting a sufficiently high valuation upon them, because at the rate they are now being used they will not last many years."

"Would it injure your business at all if iron ores were admitted free of duty."

Free Iron Ore.

"I think not, and I think that practically we have free iron ore at the present time, for the reason that a drawback of duty is allowed whenever goods are exported manufactured from imported ores; hence any manufacturer of steel will probably export enough of his product to get the rebate on the imported ores."

"How do you think the admission of ores free of duty would affect the miners of Port Henry, N. Y.?" asked Commissioner Clark.

"It would undoubtedly affect them somewhat, as that is a mine in the Eastern district. I am not familiar with the details of its business, but I would judge that it is one of the large deposits in the East with which imported ores would come in competition."

"What effect would free ore have on the American consumer of the finished product?"

"None at all, in my opinion, because even with free ores the great bulk of the ores must come from the Northwest."

"Would free ores affect the Maryland Steel Company favorably?"

"Undoubtedly, but it should be remembered that practically they have free ores now."

Referring to a statement made before the Commission by Edward Atkinson, Commissioner Kennedy asked if it were true that the tariff on scrap iron and steel prevented the starting up of manufacturing industries along the Atlantic Coast, to which Mr. Schwab replied that he should not think there could be anything in such a contention. It might be a local question, but it certainly could not affect the broad situation. Continuing, Mr. Schwab said that the Carnegie Company imported small quantities of scrap from Canada, but always shipped out enough finished goods with benefit of drawback to offset the duty of $4 per ton. The item, however, was a very small one and probably did not exceed one-half of 1 per cent.

Replying to a question as to whether the capital of the United States Steel Corporation was owned by a larger number of individuals than had been the case under the constituent companies, Mr. Schwab said he did not know. So far as the effect of the consolidation upon stock in the Carnegie Company was concerned the ownership of the corresponding securities was probably more widely distributed, but that company were unique in the respect that practically all of their stockholders except Mr. Carnegie were people without capital who were given stock for their services and hence retained it. The argument, however, would only apply to the Carnegie Company, because the stocks of all the other constituent companies had previously been sold on the market. At this point Commissioner Litchman asked Mr. Schwab if he still entertained the opinion expressed by him in an article contributed to the *North American Review*, in which he said:

"Under the old individual business scheme the skilled worker had only limited opportunity for increased pay and practically no opportunity for a partnership participation. Business enterprises, with a few notable exceptions, were held as close family corporations. Outsiders were rarely admitted. No matter how expert these outsiders were they were held all their lives on a salary. The concerns where this rule did not apply expanded much more rapidly than their competitors, but the example so set was apparently not sufficiently attractive to induce its general application. It remained for the system of combination to make this scheme general, and to open up for young men of brains opportunities that heretofore have been closed to them."

Commenting on this extract Mr. Schwab said that it still expressed his opinions, and he added: "I certainly am not changing my views when I say to you that I have attempted to put this whole scheme on such a basis that the skilled operator and the valuable man will make something other than his salary—some holding in the company. That is what I have just said we did in the Carnegie Company."

"You think these companies do not restrict the opportunities for men to succeed in business enterprises?"

"I think it is quite the reverse. I think there never was a greater opportunity for any man, workingman or manager, who has to use his brains as to-day. Never has there been such a scarcity of the special men that great manufacturing concerns and capitalists desire."

Professor Jenks asked whether it were not true that the consolidation resulted in the discharge of a large number of employees, to which the witness replied that the services of certain persons in the different directorates, superintendents, &c., were dispensed with, but these were all in a high salaried class. No workingmen or low salaried employees to speak of were dismissed. Chairman Phillips asked whether a man with a small capital had the same opportunities to suceed to-day that he enjoyed before the organization of the big consolidations, and Mr. Schwab replied that he would have an excellent opportunity to become a large stockholder in a big corporation, but that his capital probably could not be used to such good advantage as formerly in the establishment of an independent business.

The Question of Wages.

Taking up the subject of wages Mr. Schwab said that the average annual earnings of the workmen of the Carnegie Company since 1892 were greater than any year before 1892, but during the past nine years there had been no "aristocracy" among the workmen earning $100 per day per man, while others earned only $1. Prior to 1892 the labor organizations controlled the wages, but since that date there had been no unions at any of the steel works. Greater wages had been paid on the average but not so high to special men. The arbitrary scales fixed by the unions for some of the mills operated in such a way that with the special facilities provided at the Carnegie Works the men paid on a tonnage basis received three or four times the amount per day paid to equally skilled men in other mills doing the same thing. The men themselves recognized the injustice of such an arrangement and freely admitted it. The rules of the union also limited the output, which was a very serious matter, as it greatly increased the proportion of the fixed charges to be carried by each ton of product. Since 1892 this had all been changed, and Mr. Schwab added that during a recent visit to England he had told the iron and steel manufacturers that they would never be able to compete with the United States because of the unreasonable rules of the unions. In England certain machines were only permitted to produce one-third as much as in the United States, with the result that the cost of production was greatly increased. The difficulty with labor unions to-day was not usually one of wages, but was simply whether the proprietors would surrender the control of their works to their men. At one time, prior to 1892, the men employed by the Carnegie Company took it upon themselves not only to select their own foreman but to provide a method by which his successor could be chosen. Mr. Schwab said he saw no objection to agreements with the men as to wages on a sliding scale and otherwise, provided the administration of the work were left alone. He added that although the Carnegie Company were non-union at their rail mills at Braddock, wages were regulated by a sliding scale in accordance with the price of the product, but the company fixed a minimum limit below which they might not go, so that the workingman should not suffer on account of too keen competition on the part of the firm. There was no maximum, however. Replying to a question as to whether the wage scales in force in certain of the

constituent companies of the new consolidation had been taken over by the United States Steel Corporation Mr. Schwab replied:

"Undoubtedly. We would not abrogate them under any consideration. We live up to our bargains."

"Will you say they will always be continued?"

"I will not answer."

"Are you not likely," asked Commissioner Litchman, "to have an acquaintance with organized labor in the immediate future?"

"Quite probably," replied Mr. Schwab, adding with a smile, "on second thoughts I do not think I shall; I think that will fall to the lot of the presidents of the subsidiary concerns."

"Are you not aware," asked Commissioner Farquhar, "that there is a mass of testimony before this Commission to the effect that agreements are being made in all the trades—the molders, carpenters, building trades, &c.—between employers and employees that last from 12 months to two years, and that there are no strikes?"

"No strikes during those periods," commented the witness. "That is true, but the periods recur pretty often and give a good excuse for differences."

"It is a compliment to you," said Mr. Farquhar, "to say that you came up from the ranks, and I would like to ask if you do not regard it as desirable to prevent as much as possible the friction that has been common to organized labor in this country?"

"After a careful study of the whole situation," replied the witness, "if I were to-day a workingman, as I was, in one of those mills, especially if managed under the broad policy that governs steel manufacture, I would not want to belong to a labor organization. It puts all men, no matter what their ability, in the same class, on exactly the same level. If I was a better workman, quicker, smarter than the other men, I would want to reap the benefit. I would not want to be put in the same class with the poorer man. If we have 500 men employed at the same class of labor the union requires that the wages paid must be the same, and the level is that of the poorest man in that department. I think it is a great mistake and a great injury to labor. I think the principle of these great companies is to preserve and give to their workingmen as high wages as they can possibly give them, and that has been the tendency always, especially in steel. In no line of manufacture that I know of have the wages been so good on an average as in steel. At the Homestead steel works during the last year the average wage earned by every man and boy employed at the whole works—and there are a great many boys and a great many laborers—the average of everybody, excluding salaried men, was nearly $4 a day, whether they worked or not. The lowest wage paid was $1.50 per day for common labor."

"What was the maximum?" asked Commissioner Conger.

"Well," replied the witness with a smile, "that question reminds me of a joke I heard at Weber & Fields' the other night. One man asked the other what he would do for $10,000. He replied, 'I am ashamed to tell.' I could not tell you how high the maximum wages are. I have seen them at Homestead previous to 1892 exceed $100 a day, but they have been much reduced and are not one-fourth that amount now."

On the subject of Sunday labor in the steel works, Mr. Schwab said it was not carried on wherever it could be avoided.

"Any one who is familiar with steel," he continued, "knows that a great deal of work must be carried on continuously. There is no other way to do it, and it is a practice all the world over. Now, the Carnegie Steel Company, like many others, have started their works on Sunday night. They have stopped on Saturday at 2 o'clock and started Sunday night at 5, and the reasons are that if they did not start at that time the chances are that just as many men would have to be brought out to the furnaces to handle the product on Sunday as would be necessary to run the mill on Sunday night and do that handling. I have said to all the people in our employ that we would be perfectly willing to stop Sunday, working late Saturday night and starting early Monday morning, or to make that 24-hour stop at any time, for that is practically as long a stop as you can make without great loss and extra labor. You must run continuously from the ore, and you cannot stop the consuming part very long. I took a vote among the workingmen, and the majority of them decided they wanted to continue the practice of working Sunday night and having Saturday off."

Referring to the benefit funds maintained by the Carnegie Company, Mr. Schwab said that Mr. Carnegie had been somewhat peculiar in not permitting any mutual benefit funds. The workingmen had not been asked to contribute anything, but the firm had taken care of the sick and disabled men. Recently Mr. Carnegie had put aside a fund of $5,000,000, the interest of which was to be devoted to the pensioning of disabled or worn out workmen, the administration being in the hands of the superintendents of the Homestead, Braddock and Duquesne works.

Replying to a question Mr. Schwab said the percentage of accidents was much less in the larger establishments than in the smaller ones. A very accurate record had been kept and would be furnished to the Commission.

"Is it a fact," asked Commissioner Litchman, "that the inducement to invention has been stifled by these combinations?"

"It is quite the reverse," was the reply. "Never has the manufacturing world been so anxious to pay for an invention as to-day, and never have they commanded such high prices. Salaries of skilled men have never been so high, and I think they will continue to increase."

"Is there a point," asked Commissioner Farquhar, "in capitalization reaching beyond the millions where it would be almost impossible to hire administrative capacity sufficent to run a concern without loss?"

"I would only say," answered the witness, "that it is a matter of the greatest difficulty to-day. We may reach such a point, but it is a long distance off yet, I hope. Each man in authority surrounds himself with a staff of officers who are accustomed to working with him. No two men have the same *personnel*. A man that has been trained many years in manufacturing will probably want men of business ability working with him, and *vice versa*. But success depends altogether on the selection of his staff and his ability to infuse that staff with his ideas of management. That is the chief thing. In most instances our present managers are practical men, but we have both. I think, however, that practical men are those who are likely to rule the manufacturing part of the business."

The Capitalization of the U. S. Steel Corporation.

At the request of Professor Jenks Mr. Schwab then took up the question of the capitalization of the big merger, and, in reply to a question as to the proportion of its tangible assets, he said:

"That is entirely a question as to the valuation you put upon your raw material resources. If I were putting the raw materials into this capitalization it would not be big enough. I claim that our ore and coking coals, limestone, &c., are of much more value than people, as a rule, have ever given to them. For example, this company have over 500,000,000 tons of ore in sight in the Northwest. Now, it does not take many dollars per ton on that ore alone to equal the capitalization of these concerns. We own something like 60,000 acres of Connellsville coal. You could not buy it for $80,000 an acre, for there is no more Connellsville coal. If the consumption of steel increases in the future as it has in the past I believe the Connellsville coal will be exhausted in 30 years. If the consumption of iron ore in the Northwest goes on as it has in the past it will not last very long, perhaps 60 years. Of course there are other coals, but it is a well-known fact that the Connellsville coking coal is an ideal coal for manufacturing purposes. Now, this coal field is very clearly defined, and every acre of it is highly prized, and it is owned by these constituent companies *in toto*. There may be developments of coal in other directions, but nothing like this coal; therefore I say the matter of capitalization depends very largely on the value you put on the raw material."

Referring to the question of the possible development of the export trade, Mr. Schwab said he thought it very likely that the constituent companies, producing 75 per cent. of the product of the United States, had been able to dictate prices to the European manufacturer, and he assumed that the United States Steel Corporation would probably be able to do it hereafter.

"I think," said he, "the export business will probably be greater in the future than in the past, because some of the smaller constituent companies have not been organized as some of the larger ones have for conducting an export business. The percentage they could have sent abroad was so small it would not have justified the establishment of extensive foreign agencies for doing this business. Now it will probably be done through a consolidation of foreign agencies and a greater tonnage will be taken."

"Given a big merchant marine," said Mr. Farquhar, "to zone the world's markets, do you think, then, America in the steel trade could control prices?"

The Lack of American Shipping.

"More largely than ever," replied Mr. Schwab. "One of the chief difficulties of an extensive foreign business is the lack of American shipping. I have given this much thought. It costs more to carry a ton of billets or rails from Pittsburgh to European shores than it costs the Pittsburgh manufacturers to make a ton of steel from the pig iron. Now I claim that steel products constitute the most desirable class of ocean freights known, and ought to be carried from New York to Liverpool for about one-half the present cost, and carried profitably when ships are arranged for the purpose; but you can easily see that when we have to employ foreign shipping to carry our products they are not going to do it without very great profit to themselves, as against the people who give them business on the other side. They will be constrained considerably by the fact that the bottoms are owned in Europe and that America is competing with Europe."

Replying to a question by Commissioner Kennedy, Mr. Schwab said he did not think it possible that a "world combination" having no regard for the tariffs of any country could be brought about in the iron and steel industry.

The Babcock Bill.

"Has your attention been called," asked Commissioner Clark, "to the bill introduced in Congress by Mr. Babcock of Wisconsin?"

"Yes," replied the witness, "I know it in a general way. I do not see that it would do anybody any good. It would not hurt anybody in those lines where we need no tariff, and in those lines where protection is necessary the only persons it would hurt would be the working people. After you fix the price on your raw materials that you think is fair everything entering is labor. You may say that labor does not form a very considerable part; here is $5 for steel, and the labor is 50 cents. But remember that everything that goes into the finished product has had labor expended upon it at some time, and it is by all odds the one really important item of expense. Labor in the nickel mines gives us the nickel; in the manganese mines it makes the cost of the ore, and it is the cost of labor to the railroads that constitutes your freight."

"Is it your opinion that there is anything in the conditions of business in this country at the present time which calls for an early general revision of the tariff?"

"I do not think so. I should like to see it left alone. That is my personal opinion. I think it is unwise to disturb these things when there is no necessity for doing it. The tariff on rails and billets is not enough to hurt if you are not bringing them in. It may be inconsistent, but that is a point of view I am not prepared to discuss."

"Do you think the tariff policy of this country for the past four years is the reason of our great wealth?"

"Undoubtedly. I know of no other reason so important."

"It is claimed," said Commissioner Harris, "that the seven constituent companies composing the United States Steel Corporation, aside from the Carnegie Company, were overcapitalized when they were organized, and that now the United States Steel Corporation is overcapitalized, and that the consumer will be compelled to pay a higher price to pay dividends on this large capitalization. Is it true?"

"Do you think it is true?" asked Mr. Schwab by way of reply. "If the dividends have to be made on too large a capitalization is it not likely that the people who claim to have a more conservative capitalization would do the business at a lower price?"

"How do you account for the large difference between the capitalization of the United States Steel Corporation to-day and that of the constituent companies, exclusive of the bonds issued in payment?"

"There is not a very wide difference, if you think it all over. All these companies from the date of their organization up to the present time have added to their assets. Then, they have created values by coming together, and the owning of these stocks by one corporation will enhance the value of them all for the reasons I have given in the line of economies. I think, furthermore, that the values placed on raw materials in the shape of ores and coal have never been excessive, and the amount of capitalization depends entirely upon the valuation placed upon those resources."

Commissioner Harris then addressed a series of questions to Mr. Schwab designed to bring out the basis of the valuation given by the managers of the merger to the stocks of the constituent companies, but the witness smilingly declined to go into that phase of the subject, saying that he did not make the agreement and that the Commission would have to get such details from Mr. Morgan. Commissioner Litchman said there was a "general feeling of unrest" on the part of the public concerning the basis of the capitalization of the merger, and that the Commission hoped Mr. Schwab would be able to give figures calculated to relieve the public mind, but the witness replied that he certainly could not do so off hand, and he could not promise to go further into that branch of the question at any time. Commissioner Farquhar suggested that there was a popular impression to the effect that the constituent companies had been obliged to take the Carnegie Company in at their own price, at which Mr. Schwab remarked:

"We should feel flattered, I am sure. I had no idea we were so well regarded."

Several questions were addressed to the witness with a view to drawing out a statement with regard to the compensation received by the promoters, but Mr. Schwab steered clear of the subject with considerable skill, saying that he had found his own abilities fully employed in handling the interests of the Carnegie Company in the merger, and would have to refer the Commission to Mr. Morgan for all financial details. Mr. Stimson, the legal adviser of the Commission, raised the point that it was not customary in corporations to carry iron and coal mines on their books at large valuations, but Mr. Schwab replied that while they were usually put in at the outset at cost, yet if they appreciated in value by reason of the fact that a limit could be placed upon the possible sources of supply they certainly would possess a higher value if considered at any subsequent period. The hearing was concluded by Professor Jenks, who asked the witness for his opinion as to the general effect of the formation of such consolidations as the United States Steel Corporation, to which Mr. Schwab replied:

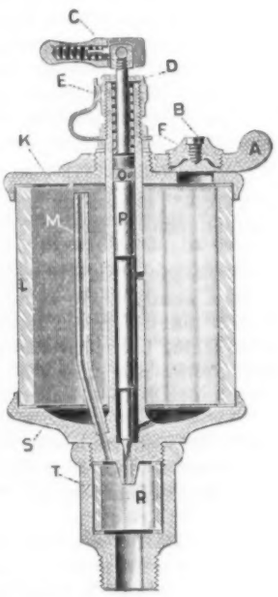
"I firmly believe that the results of these great consolidations will be of benefit both to the investor and the laborer. Labor has already been greatly benefited, and I think that as the result of this development of industrial methods we can sell our products at fair prices and pay good wages. I can see nothing in the future but good results." W. L. C.

The population of London, including the city of London and 28 Metropolitan boroughs, the whole forming what is termed the administrative county of London, is now 4,536,034. This is an increase of 308,717 since the last census in 1891.

The Lunkenheimer Sight Feed Lubricator.

The improved glass body sight feed lubricator made by the Lunkenheimer Company of Cincinnati is intended for gas, gasoline or oil engines.

The filling arrangement consists of a screw down slide filler. Referring to the illustration it will be seen that the slide A screws down on and around the lid of the cup and has a loose plug which covers the filling hole when the slide is swung over to a closed position. This loose plug is so arranged that the wear on it can be adjusted by turning down screw B. The whole construction is very heavy, and the slide can be depended upon to seat perfectly and remain tight for an almost indefinite period. On account of this construction it is possible to secure a large filling hole, which is a desirable feature. The feed regulating mechanism can be put on or off by raising or lowering the cam lever C. The rate of feed can be adjusted by turning the nut D, which is prevented from loosening by the spring E. By this arrangement the feed can be set and turned on or off without disturbing the rate of flow. The cup is thoroughly packed, both around the stem and at the top and bottom of the body and sight feed glasses and cannot become leaky. The whole cup is secured together by a lock nut construction, which makes it impossible for it to jar apart, due to the shaking of the engine, and also dispenses with the annoyance of oil leaks. The sight feed glass is quite large and can be readily cleaned by unscrewing the upper part of the cup from the base piece.



THE LUNKENHEIMER SIGHT FEED LUBRICATOR.

During the month of April the *Railroad Gazette* noted in its news columns orders for 11,915 cars and 286 locomotives, which may be compared with 3580 cars and 161 locomotives ordered in the corresponding month last year. So far each month this year has shown a big increase over the orders placed in the same time last year. The April car orders are divided as follows: Box, stock and refrigerator cars, 6673; coal and ore cars, 4636; flat cars, 395; tank cars, 13, and passenger cars, 198.

Andrew M. Moreland, formerly secretary of the Carnegie Steel Company of Pittsburgh, has entered suit in New York City to recover $88,400 from Wm. J. Hilands of Chicago. Mr. Moreland claims that Hilands obtained an option from him on 884 shares of Carnegie Company stock at $1200 a share. The stock, Moreland claims, was sold by Hilands to J. P. Morgan & Co. for $1300 a share, Hilands retaining the difference of $100 a share, or $88,400. Moreland seeks to recover this sum, alleging he paid Hilands $4000 commission for his work.

The Lake Superior and Ontario Consolidation.

The Philadelphia *Financial News* prints the following summary of the plan proposed for the consolidation of the Clergue enterprises, the Consolidated Lake Superior Company, and the Ontario Lake Superior Company:

The capital stock of the Consolidated Lake Superior Company to be increased, by resolution of the stockholders, so that the total capital stock shall be: $35,000,000 preferred, 7 per cent., non-cumulative; $82,000,000 common. The par value of each share of stock to be changed from $50 to $100.

A stock dividend to be declared on the preferred and common stock of the Consolidated Lake Superior Company based on a reappraisal of assets, particularly of the Helen iron mine, to the extent of 25 per cent. on preferred stock, payable in preferred stock, making each $100 of present holdings $125 in preferred stock; 100 per cent. on common stock, payable in common stock, making each $100 of present holdings $200 in common stock.

After the declaration of the above stock dividends, and upon the surrender of the present outstanding preferred and common stock certificates of the par value of $50 per share, new certificates of the par value of $100 will be issued for an equal amount in value. At the same time orders will be given for the preferred and common stock dividends for which certificates will be issued after June 1, 1901.

The cash dividend on the present holdings of preferred stock to be paid June 15, 1901, to stockholders of record May 31, 1901, and quarterly thereafter on the entire amount.

The stock of the Ontario Lake Superior Company to be acquired by giving in exchange $125 par value of the new issue of Consolidated preferred stock for $100 par value of Ontario preferred stock, and $200 par value of the new issue of Consolidated common stock for $100 par value of Ontario common stock.

Dividend on preferred Ontario stock to be adjusted as of June 1, 1901, the date on which the dividend on the stock of the Consolidated Company received in exchange begins to accrue.

After providing for the stock dividends above referred to, and for acquiring the stock of the Ontario Lake Superior Company, the balance of the increased issue of preferred and common stock of the Consolidated Lake Superior Company will be used for the enlargement of the steel plant now in course of construction at Sault Ste. Marie, Ontario, to the capacity of 2500 tons of steel daily, and for other subsidiary undertakings collateral thereto.

Due notice of declaration of above stock dividends and exchange of certificates will be given stockholders.

A special meeting of the Consolidated Lake Superior Company stockholders will be held May 16, at New Haven, Conn., to approve the increase of capital stock, change in par value of the shares, increase in number of directors, and amendments to the charter as contemplated under the provisions of the consolidation plan.

E. V. Douglas, James S. Swartz and F. Lewis have been appointed trustees, in order to carry out the plan with dispatch, a considerable amount of the new preferred stock having been underwritten and over two-thirds of the stockholders of both companies having already given their assent to the plan.

Each preferred and common stockholder of the Consolidated Lake Superior and of the Ontario Lake Superior Company shall be granted, through the medium of a negotiable warrant, to be issued May 16, 1901, the right to purchase of the increased preferred stock of the Consolidated Lake Superior Company, at par, an amount equal to 50 per cent. of present holdings as of record on the stock books of said companies at 3 p.m., May 10, 1901, and receive an equal amount of common stock upon the terms and conditions hereafter stated. Payment for the preferred stock thus purchased shall be made as follows: 25 per cent. at time of making application, not later than May 31, 1901; 25 per cent. on January 5, 1902; 25 per cent. on July 5, 1902; 25 per cent. on January 5, 1903.

The Lake Superior Power and Algoma Commercial

companies have arranged that the holders of the installment receipts issued by the Provident Life & Trust Company, trustee, will be granted through the medium of negotiable warrants, to be issued May 16, 1901, the right to purchase of the increased preferred stock of the Consolidated Lake Superior Company, at par, an amount equal to 50 per cent. of the par value of the number of shares called for on such receipts, together with an equal amount of common stock on the same terms and conditions as are extended to holders of full paid stock; and such holders will further receive, when all installments have been paid, certificates for the preferred stock, together with the stock dividend of 25 per cent.

Negotiable receipts will be issued, on which payments will be indorsed as made, entitling the holder to receive interest on the amount paid, at the same rate as the preferred stock dividend. Fifty per cent. of the common stock to which each purchaser is entitled will be due at the time of making the first payment, and will be delivered as early thereafter as the certificates can be engraved and issued, and the remaining 50 per cent. when the second payment is made.

Purchasers are granted the option of paying in full for said preferred stock at any installment period, and when such payment is made shall receive certificates for preferred stock and any amount of common stock to which they may then be entitled.

Canadian News.

North Sydney's Expectations.

TORONTO, May 11, 1901.—A rumor that takes on more and more the appearance of probability as it passes points to the likelihood of new steel works being erected at North Sydney. That town is on the opposite side of the same inlet as that on which Sydney is situated, North Sydney being near its mouth, while somewhat further north stands Sydney Mines. The Nova Scotia Steel Company, whose furnaces are at New Glasgow, now own the famous coal mines at Sydney Mines, having purchased them last year from the General Mining Association. They also own a considerable portion of the iron deposits on Belle Island, having reserved this from the part sold to the Dominion Iron & Steel Company. The company seem to have steadily kept in view the project of establishing great iron and steel works at North Sydney, but the carrying out of the project has been deferred. Now it is announced that the work will be undertaken and carried out. It is reported that all the Nova Scotia Steel Company's property at New Glasgow, Sydney Mines and Belle Island has been bonded to a syndicate of English capitalists. The amounts for which the several properties are bonded are said to be $3,000,000 for the Sydney Mines, $1,000,000 for the Belle Island iron deposits and $1,000,000 for the Trenton works. The coal mines cost the company $1,500,000 last year, but the advance in the price of coal since then may enable them to sell out at double the price, especially if stock is given in payment.

On first sight it might seem that the existence of the works of the Dominion Iron & Steel Company would deter capital from going into another iron and steel plant in Cape Breton. But recent developments have disturbed the balance somewhat. The consolidation of so great a part of the steel industry of the United States is regarded as rather favorable to the chances of steel works at North Sydney.

In another way the consolidation of the American steel industry tends to work in harmony with the project of the Nova Scotia Steel Company. It has moved English steel manufacturers to prepare for intenser competition, and has improved the chances of some of them going into business in Cape Breton. The presence there of the Dominion Iron & Steel Company has rather been a recommendation than a deterrent. It has proved that the resources of producing iron and steel are all that they have been represented to be. The prospectus in which the Dominion Iron & Steel Company offered their last issue of stock received wide attention, and went far to advertise not alone that company's advantages, but the advantages of Cape Breton generally as a field for iron making.

Lead Refining.

A cargo of 2700 tons of lead concentrates left St. John, N. B., recently for Antwerp. The lead came from Kootenay, B. C. It is to be made into white lead, red lead, orange, litharge and the like, and in these forms will be returned to Canada to be used in making paint. Efforts have been made this session to induce the Dominion Government to assist in establishing a lead refining industry in Canada. A large and influential deputation from the British Columbia silver-lead country waited upon the Government to urge the granting of a bounty or the conceding of aid in some other form. Their specific request was for a bounty of $5 per ton on the refined lead, the arrangement to hold for five years. Further, they asked that the duties on lead be equalized to those holding in the United States. It was stated by the deputation that the lead mining industry is in a bad way. One member of the deputation declared that his own mines, in which last year he had paid $1000 a day in wages and from which he shipped 1000 tons per day, were now closed, having been forced out of production, he maintained, by the American smelter trust. The output had been shipped to the United States, but at the expiration of the contract the trust refused to receive any more shipments from the British Columbia mines. To get the lead refined in the United States was, the deputation said, practically impossible, as the smelting rate had been increased by $4 a ton.

Notes.

The steamer "Troild" is loading pig iron for Glasgow at the Dominion Iron & Steel Company's pier in Sydney.

Attorney-General Longley has returned from England to his home in Nova Scotia. He says he invited the British iron and steel manufacturers to consider the advisableness of establishing branch works in Nova Scotia. He says the Cape Breton iron and steel works are receiving great attention in British iron and steel making circles.

Iron ore is being shipped from the New Find mine in Hastings, Ont., to the Radnor Furnace, and from the Child's mine in the same county to the Deseronto Furnace.

The best men on the staff of the Canadian Geological Survey appear to be in demand in the service of iron and steel companies. A. P. Low is going to Labrador for a Philadelphia syndicate. He is the only man who has any scientific knowledge of the mountains of iron ore in Labrador. Another member of the staff is said to have accepted an engagement with Mr. Clergue, and a third is going into mining business on his own account.

The Pressed Steel Car & Wheel Company, with a capital of $700,000, have been incorporated. The head office is at Perth, Ont.

R. M. Thompson, New York; J. J. Thompson, Bayonne, N. J.; J. W. Shiles, Copper Cliff, Ont.; G. M. Byres, Sudbury, and R. J. Leckie, Truro, N. S., have been incorporated as the Massey Station Mining Company, with a share capital of $300,000.

The Algoma Iron & Nickel-Steel Company's bill has been so amended as to give the company authority to increase their capital stock to $40,000,000, and also to take stock in any company using their water power.

C. A. C. J.

In the United States Circuit Court, in Pittsburgh, a bill in equity has been filed by the National Tube Company against Spang, Chalfant & Co., Incorporated, alleging an infringement in the rolling of skelp into pipe. The complainants ask for an accounting, and that the defendant company be restrained from further use of the device. A preliminary injunction is also asked for.

The Holland Submarine Boat Company of New York have purchased property at Sayville, Long Island, and contracts have been let for the erection of suitable buildings for the construction of the Holland submarine boats. It is reported that the British Government has ordered two boats of the Holland type.

Notes from Great Britain.

Office of *The Iron Age*, Hastings House, Norfolk Street, Strand, W. C.

The Markets.

The British metal markets at the present moment, taken altogether, are something in the nature of a Chinese puzzle. In Scotland, conditions have undoubtedly improved, and satisfactory bargains have been struck with Canada in the west and India in the east, while the Germans, who so largely caused the slump last September, are now renewing negotiations, and are even asking for contracts up to 1902. On the northeast coast things are in *statu quo*, while in the Midlands the whole market has been taken by surprise by the unexpected reduction in the price of marked bars by $5, bringing the standard price down to $42.50. The result of this has been that the "bears" have been busy on common iron, so that owners of unmarked bars are severely pressed, and are not unlikely to be compelled to give way. Considerable feeling has been evinced on account of this sudden reduction in marked bars. It is said that if the reduction had to take place, it should have been announced at the turn of the quarter, when business was flat and consumers were waiting for reductions. Now that the market is to some extent solidifying, it is irritating to find prices once again unsettled. The reason advanced by the marked bar makers is that they could not any longer maintain the disparity in price between marked and unmarked bars—a disparity amounting to $15 per ton. It is interesting to note that the price of marked bars is now only $5 above the price obtaining at the commencement of the trade boom. In September, 1898, the price stood at $37.50. In October of that year the upward move began with a rise of $2.50, followed in April, 1899, by a similar advance. The marked bar market is back, therefore, exactly at what it was in April, 1899. The real reason, I imagine, is that the marked bar makers have been frightened, and have determined to stimulate orders without further delay. Undoubtedly we are on the eve of a further reduction in the cost of raw material, so that the reduction would appear to be based upon common sense conclusions, notwithstanding the delay of one month, of which such strong complaint is made.

Another weakness and menace is the continued flatness of the price of Cleveland pig iron, which, of course, depresses the market both in Lancashire and the west of Scotland. The European market appears to be strengthening, and there is at the present moment unusual activity in Belgian girders. It is reported that several orders for girders have come from Canada, which were previously placed in the United States. *The Iron Age* cable, which is carefully scanned in Scotland, points to increased buoyancy of the American market, but the *Ironmonger* cable indicates nervousness, and, altogether, a feeling is prevalent that in America the top of the boom has been reached. There is no immediate fear of American competition being felt, as American steel plates at the present moment cannot be delivered into this country at much under $45, and as Scotch makers are selling at $27.50 it is obvious that the danger of American competition will be delayed. Matters seem to be mending in China and the Far East generally, notwithstanding the Indian famine, and in consequence orders are coming in to English tube makers. The tube trade has been further strengthened by the receipt of several good orders from marine engineers for boilers, due in its turn to an increased number of contracts secured by shipbuilders on the Clyde. Notwithstanding, therefore, the feeling of depression created by the unexpected fall in the Midlands in the price of marked bars, the markets generally would appear at the present moment to be more buoyant than they have been since last August. Time will show if this feeling is the outcome of wise prescience, or is merely a transient emotion. My own personal opinion is that so far from there being any likelihood of a trade boom in the future, as some of the iron manufacturers anticipate, we are much more likely to encounter even worse conditions of trade. The absence from South Africa—temporary or otherwise—of Sir Alfred Milner, is supposed to have led to a reopening of peace negotiations by Lord Kitchener, who, by all accounts, is anxious to bring the war to a diplomatic conclusion. If this be so, there may be a slight temporary excitement in the metal market, but as the South African banking arrangements are in a state of chaos and the country generally in a state of destitution, it is difficult to see any immediate probability of stimulated trade. Doubtless the gold mines will be set to work without delay, and as a certain amount of machinery has been destroyed or gone out of date, something may crop up to help home engineers, but at the present moment all that is the wildest surmise, and the largest buyers are the most cautious.

Taking It Out of the Coal Owners.

It is now quite clear that the Government mean to proceed in their proposed export tax upon coal of 25 cents a ton. It is a little amusing to observe a sort of suppressed feeling of gratified revenge among the manufacturers of finished metal goods. The coal owners have been asking for sympathy, and have failed to get it. For example, the Mining Association of Great Britain has asked the Walsall Chamber of Commerce to pass a resolution against the proposed export duty. It was promptly moved that the communication lie on the table. One of the members of the Walsall Chamber of Commerce, in making this motion, remarked that it was rather disgusting that the coal owners should go whining about the country over a duty of 25 cents per ton on coal, when they themselves had put from $2.50 to $3 a ton onto the usual price during the past 12 months. He said that his firm had been paying $7.75 for South Wales coal, as against $3.80, prior to the boom, and that as the coal owners had no regard to the effect on trade such an increase was likely to have, he was very indifferent about the coal duty. The resolution to take no action was passed unanimously. In this connection it is now interesting to discover exactly what the burden has been upon manufacturers caused by the abnormally high prices of coal during the past two years. I append herewith some average costs of South Wales coal during the past five years, from which readers will at once glean some idea of the stupendous fortunes that have been made by the coal owners at the expense of the manufacturers and the shipping interests:

Year.	Coal exported (millions of tons).	Home consumption (millions of tons).	Price free on board at Cardiff (average of year).
1896	33		$2.38
1897	35 1-3		2.38
1898	35	Average, 165	2.42
1899	41		3.10
1900	44		4.40

Assuming, therefore, that the coal owners did not sell at a loss during the years 1896 and 1897, the above figures show what a stupendous tax has been placed by the coal owners upon British industries during 1899 and 1900.

Testing American Work.

Lord Cromer's report on Egypt and the Soudan, which has just been received by the British Government, includes a most interesting document from F. Trevithick on the locomotive and carriage department. The document in question contains some very frank criticisms upon American locomotives. The writer says: "The equipment of American make now in use is 20 locomotives, 300 wagons and nine machine tools. . . . The locomotives have already run an average of nearly 70,000 miles without having entered the workshops for general repairs; they have earned for themselves a satisfactory reputation as regards design and quality of material. . . . The workmanship of these locomotives, with the exception of the working parts, is rough, and far short of the finish that is considered desirable by European engineers. . . . The expense incurred in neatly finishing portions, other than working portions, goes far to account for the difference of cost between American and English make of locomotive, while it is difficult to gauge to what extent a high standard of finish is fruitful of good through the greater interest and care the working staff is likely to take in attending a well appointed machine. . . . I am inclined to think

the coal consumption of these engines is high." With regard to the 300 wagons of 30 tons capacity, it is further alleged that the workmanship is unsatisfactory, and that there is an abnormal wear between the bogey bolsters and the stirrups supporting them. F. Trevithick, however, is laudatory of the American machine tools, which he says have given complete satisfaction. But if he is hard in his criticisms upon American locomotives, he is far more severe upon the locomotives of Belgian make. The Belgian engines are condemned mainly because of the large percentage of temporary disablements of engines due to burst boiler tubes. The comparison between the English and the Belgian make is thus set out: "The life of the tubes of the 18 engines of the English make has averaged nine years and 11 months and 264,356 miles, as against six years and six months and 183,743 miles in the case of 58 engines of Belgian (Franco-Belge Company's) make. The average Franco-Belge Company's price for 74 engines was £E.2206, as against £E.2251 in the case of Neilson, one of the foremost of locomotive manufacturers, and considering that, during the last three years, the administration has purchased 33,075 boiler tubes, costing £E.24,777, and has also had to defray the cost of labor in retubing, it will be readily understood how shortsighted has been the policy of accepting the lowest offer."

It goes without saying that this report will be used for all it is worth by British engineers in pushing their trade, not only in Egypt, but elsewhere.

The Department Store Law in Germany.

Frank H. Mason, Consul-General at Berlin, sends the following interesting report on the working of the new German law taxing the department stores:

When in June last the Prussian Diet, after long debate and serious consideration, enacted the now famous statute for the special taxation of department stores, there was a general prediction among the opponents of that measure that its enforcement, which was to begin with the year 1901, would develop some results which the friends of the law and the Finance Minister of Prussia, who had consented to its enactment, did not foresee.

The result seems to have fulfilled these predictions. By the terms of the statute owners of department stores had six months in which to prepare for submission to its requirements. This period they utilized by making new contracts with manufacturers of various classes of merchandise in which, as it is credibly reported, they secured discounts and additional concessions which will offset the added taxes which they now have to pay on their aggregate turnover. It happened that the last six months of 1900 was an unusually propitious time for such negotiations. The long period of intense activity in most lines had apparently passed its zenith; the time of reaction and declining demand had begun. Manufacturers were flush with the earnings of previous years; their productive capacity was expanded to the fullest limit; they were able and willing to make large contracts at prices which, although they might yield little or no profit, would enable them to keep their factories going and their operatives employed until the momentary cloud of depression should blow over. And so the department store managers—merchants of high ability having at their command large resources—used the plea of special taxation with potent effect and purchased their stocks for the coming year under conditions which have gone far to neutralize the effect of the new impost, so far as the trade of 1901 is concerned.

But this is not all nor the worst that has happened. It will be remembered that under the law of June last all ordinary articles of trade are divided into four groups, or categories, and it provides that every store, bazar or warehouse which shall sell articles belonging to more than one of the designated groups, and shall make sales aggregating more than 400,000 marks ($95,000) in a year, shall be subject to the progressive tax, which increases rapidly with the total amount of annual sales.

The law was framed and enacted as a measure of justice and protection to the middle class merchants, who, after long years of patient effort, have recently found themselves overshadowed and undersold by the great bazars, which buy their supplies at every advantage and sell everything needed in an ordinary household, from canned fruit to a bridal trousseau, at prices with which the smaller merchant cannot compete. But it is now found that the new law strikes a great many firms of the middle class, for whose special protection it was enacted. This is because many of these firms who do a yearly business far exceeding the taxable limit sell articles which under the law are grouped in separate categories. As an example which will illustrate hundreds of similar cases, there is a leading manufacturer of lamps and lighting apparatus who makes a specialty of high class petroleum lamps for libraries and drawing rooms. In order to secure the success of their lamps, the firm rigged up a specially constructed fireproof cellar as a depot for the best grade of petroleum, which was sold under rigid police regulations and distributed through the city by uniformed employees with handsomely painted wagons and all the paraphernalia of a select and exclusive trade. But petroleum and lamps are in separate groups under the law of June, 1900; so that the house in question have been forced to close out and discontinue their oil department or submit their whole output of lamps, as well as gas and electric lighting fixtures, to the special tax, which would amount to about 5 per cent. of their yearly turnover.

Meanwhile a large and superbly appointed new department store, equipped and managed in American style, was opened here in December last, and the original and principal establishment of that class in Berlin, against which the new law was specially aimed, has doubled its capacity and put forth greatly increased efforts and attractions during the past winter.

It is yet too soon to estimate accurately and conclusively the ultimate effects of the statute, and it is but just to remember that the present chorus of derisive comment comes mainly from journals and other sources which have been from the outset hostile to such legislation. But from what can now be seen, it is impossible not to admit that in so far as the effects of the law have yet been developed it is fulfilling the predictions of its enemies rather than the hopes of its friends.

The shut down of the works of the National Cash Register Company at Dayton, Ohio, is a somewhat discouraging event, in view of the fact that the company referred to have hitherto been regarded as among the most successful of those concerns who have made a study of, and carried into the most perfect effect, methods for improving the condition of their work people. It has been supposed that the National Cash Register Company had succeeded in establishing so complete a community of interests between themselves and their employees that no such thing as a strike or labor dispute was likely to disturb their harmony. This assumption has now been proved wrong. Some time since four molders in the employ of the company were discharged. The other foundrymen struck for their reinstatement, on the ground that the discharge of the men was unjust, and they were joined in their demand by the polishers. The officers of the company said that if the polishers struck they would shut up the factory, and they kept their word, 2300 persons thus being thrown out of employment. If such an unexpected event has occurred in this particular instance it would seem that other co-operative experiments of a like nature are liable to fail through when the time of trial comes. At any rate, the disturbance at the National Cash Register Company's works will tend to disconcert the advocates of industrial co-operation and is likely to upset some of their most cherished theories.

Reports from Scranton, Pa., state that the stockholders of the Dickson Mfg. Company received $750,000 in cash and $250,000 in bonds from the Allis-Chalmers Company.

Australian Notes.

MELBOURNE, April 8, 1901.—Tenders for the Queensland steel rail contract, concerning the letting of which *The Iron Age* gave notice two months ago, are due in London June 11. The quantities involved are 13,400 tons of steel rails and 958 tons of fish plates. Particulars are obtainable from the Agent-General in London.

The New South Wales contract for 12,000 tons of 60-pound rails was secured by Bolckow, Vaughan & Co. at £4 14s., f.o.b. England. About 900 tons fish plates were also secured from the same firm at £6 14s., f.o.b.

The outlook for the iron and steel industries becomes interesting and promising as the result of the Federal elections. The lower house has been largely filled by the electors with men pledged to high duties, while, curiously enough, and as though intended as a mild corrective, the upper house, or Senate, contains a fair proportion of absolute free traders. On the whole, however, the vote of the people has been largely cast for a protective policy, and various syndicates, holding land reputedly rich in iron deposits, appear to await with confidence the passing of duties on imported iron to enable them to secure their own market. The quality of the ore, however, has yet to be absolutely proved; but, granted this is beyond question, it must be some considerable time before this country, with her comparatively crude methods of manufacture, her high priced labor and carriage, her Factories Act (regulating everything except market prices), can hope to compete with the older markets of the world.

But there is no doubt that iron ore deposits exist largely throughout Australasia. This is especially so along the eastern coast, where coal is also found in large quantities, where there are good harbors, and within easy distance of Newcastle, with its boundless facilities for cheap manufacturing and handling. Huge capital would, of course, be required to establish iron and steel works on a payable basis, but one company at least are already tackling the problem, and no doubt there will be room for others later on.

Apropos of the above, it is worthy of note that increased railway expenditure, the unification of the different gauges throughout the colonies, new rolling stock, engines, &c., matters to be dealt with before we are much older, will make the Australian Government a customer worth having for manufactured iron and steel alone.

Taranaki (New Zealand) iron sand is again to be brought before London capitalists by a member of the New Zealand House of Representatives, E. M. Smith, who has devoted many years of his life in the endeavor to find a profitable way of working the sand, and bringing prosperity to his native town. An English engineer, a Mr. Buxton, recently started home with the intention of floating a company to work the deposits. E. B.

The Carnegie Tube Company.—The Carnegie Tube Company have been organized at Pittsburgh and may build a plant for the making of tubes at Carnegie, a suburb of that city. Reed T. Vincent is temporary president, and connected with the company is T. B. Everson, who was formerly identified with the United States Iron & Tube Company. The company are capitalized at $150,000. Application has been made for a charter.

Last week at Youngstown, Ohio, John Williams of the Amalgamated Association, with a committee examined the sales sheets of the Republic Iron & Steel Company, and found that the average price of shipments of common iron bars in March and April had been $1.27 per 100 pounds. This means that the advance which the puddlers and finishers expected in their wages for May and June will not be allowed. However, it is probable that when the next scale settlement is made the men will receive an advance, as the average price of shipments of iron bars in May and June will probably be higher than in March and April. Puddlers are being paid $4.87½ a ton for boiling.

THE WEEK.

According to the returns of this year's census, the total population of England and Wales is 32,525,716. This is an increase over the population of 1891 of 3,523,191, or, in other words, an increase of 12.15 per cent. in the last ten years. The increase for the decade between 1881 and 1891 was 11.65 per cent.

The Union Depot Bridge & Terminal Railroad Company of Kansas City, Mo., have been incorporated with a capital stock of $8,000,000 to complete the bridge across the Missouri River at Kansas City, begun 13 years ago by the Kansas City & Atlantic Railroad. In addition to the completion of the bridge, the plans of the company include 25 miles of terminal railroads and a new union station close to the City Hall. The incorporators are mostly Boston capitalists.

The Hamburg-American Line steamship "Deutschland," on her westward voyage to New York last week, made a run of 587 knots in one day, thus establishing a new trans-atlantic record for a single day's run. The "Deutschland" already holds both the eastward and westward records for the entire run across the Atlantic. Her commander expresses the opinion that the vessel will yet reach the 600-knot point for a day's run.

The Standard Oil Company are reported to have purchased 62,000 acres of land in the Beaumont oil district of Texas, for $1,250,000. The land is part of 114,000 acres belonging to Captain William White, which he originally bought for less than $2 an acre. Captain White is retaining the remaining 52,000 acres for his own use.

It is reported that the Paris Company for Lighting and Heating by Gas of Paris, France, has purchased 100,000 tons of American coal.

The Southern Industrial Convention will open in Philadelphia on June 11.

The Jacksonville fire, coming on the top of a series of heavy losses for two years past, has hit the insurance companies severely. The New York *Journal of Commerce* is of the opinion that the fire insurance business is approaching a critical period, and that this latest disaster may prove to be the last straw. Rates are insufficient to meet the losses and expenses of most companies, and the year 1901 bids fair to witness more American companies liquidating and foreign companies leaving the United States than in any previous year except that in which the Chicago conflagration occurred.

The purchase by the Hamburg-American Line of the Atlas Line of steamship is announced, the new vessels secured by the deal being the Hamburg-American Line's fleet up to 120 vessels, with an aggregate of 630,000 tons.

The new United States battle ship "Ohio" will be launched on Saturday, May 18, at the Union Iron Works, San Francisco, in the presence of President McKinley and his Cabinet.

What is claimed to be the largest ice machine ever made in the United States was shipped last week by the York Mfg. Company of York, Pa., to a Chicago packing house. The machine has a capacity of 600 tons of ice a day, and weighs 50,000 pounds. Twelve cars were required to convey it to its destination.

The great steel floating dock for the Government yard at Algiers, near New Orleans, La., has been practically completed by the Maryland Steel Company, Baltimore, Md., and will have to be floated down the Atlantic Coast and up the Gulf of Mexico to its destination. It is the largest floating dry dock in the world, and the towing of such a bulky object will be a formidable undertaking. The start will not be made until some time in September, and a number of powerful tugs will be needed for the work. The dock is 525 feet long, 100 feet wide and 28 feet deep. It has a lifting capacity of 15,000 tons, which can be increased in an emergency to 18,000 tons. The cost of the dock was $810,000. The contract calls for placing the dock in position at Algiers, so that the towing of the structure will be at the risk of the contractor.

The Iron Age

New York, Thursday, May 16, 1901.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - BUSINESS MANAGER.

Panics.

The number of causes to which panics have been attributed is as voluminous as the amount of real study of the phenomena of panics is meager. They are particularly interesting to writers of strong socialistic tendencies, because they seem to constitute an indictment of the present economic order. Their periodicity is a common impression and Clement Juglar has made ingenious but not consistent efforts to support this by a comparison of dates. Two tables prepared by him, only two years apart, designed to show the periodicity of crises, usually beginning with a panic, and their occurrence at about the same date in this country, England and France, included several small disturbances which seem to have been counted only to make the tables more convincing. The tables differ as to certain dates, and neither of them includes an English crisis in 1878 treated by Mr. Jevons as of serious magnitude. One of Mr. Juglar's tables has a crisis in each of the three countries in 1882; the other has one in France that year, another in this country and France a couple of years later, and none in England in either year.

The feature common to all panics is the contraction, actual or anticipated, of credits. The modern commercial world does not buy entirely for cash, or keep enough cash on hand to pay all obligations on demand, because it can do more business and make more profit by putting most of its wealth in other forms than money and using credit. The cash which is ample under ordinary circumstances is insufficient when an unusually large number of persons are called upon, or expect to be called upon, to settle simultaneously. If the cash which would ordinarily be loaned is withheld in anticipation of war or commercial catastrophe, those who need loans are unable to pay and so losses fall on the creditors, who may, in turn, be unable to pay their creditors, or, which is much more common, the debtor who is unable to borrow is obliged to raise money by selling any property he has. Stocks are much the most salable, which forced sale depresses their price, and this fall in price alarms other holders into selling or compels them to sell by using up their margins. In any event we have the credit system disarranged by some real or expected disaster, the ultimate effects of which cannot be known, and therefore the action under the impulse of fear, on account of which we have the term panic.

A commercial depression has often followed a panic, and while this is usually explained as the result of overproduction, it comes back to the element of credit. The manufacturer who produces goods faster than the public consumes extends credit, and if he is unable within a reasonable time to get his money back from his goods he must reduce or stop entirely. We have had panics followed by long periods of bad business, and the severest stock panic experienced in this city has just occurred, with no effect upon business. The difference is in the condition of the country at different times, the soundness or unsoundness of the currency, the reasonable or unreasonable extension of credits, the ability of business men to stand some loss without failure or their fall at the first mishap, the greater or less amount of money that had been sunk in unprofitable investments, involving losses not fully recognized till the failure of some conspicuous concern creates alarm lest others shall fail and causes some interruption of business.

With increasing wealth, perhaps increasing wisdom, and certainly more co-operation among credit institutions, the severity of panics is abating. The panic of 1866 in London has never been duplicated since, though panics as severe or more severe had occurred several times before. There will never be another "Black Friday" here, and the stock panic of last week was promptly stopped by the banking houses whose competition precipitated it and by the co-operation of banks in loaning money. The measures taken to allay this afford promise of preventive measures another time. While there is no assurance that the industrial world will not again produce faster than consumption and then experience depression until consumption catches up, yet the probability of anything so acute as a commercial crisis decreases as the danger of deep or prolonged financial or stock panics decreases, and as credit institutions gain in strength and courage. The danger point in financial panics and commercial crises is that men who are really solvent will be unable to pay at a particular moment because they are temporarily unable to collect or to borrow. The conspicuous feature of the recent development of banking is the readiness of credit institutions to save the men who are actually solvent, thus narrowing suspensions to those who are insolvent and removing the greatest element of fear or panic.

The Diversion of Speculation.

The panic in the stock market last Thursday is commonly regarded as beneficial rather than injurious to the country at large. The losers, of course, cannot think so. To them it was an overwhelming calamity. But it will undoubtedly do good in sobering the people, who were in increasing numbers being drawn into the whirlpool of stock speculation. A shock of this kind was needed to awaken them to a realizing sense of the dangerous game into which they were being attracted. For some time the stock market is likely to be left to the professionals and to those who are wealthy enough to engage in the exciting sport without fear of the consequences. The attention of others will therefore probably be diverted during these prosperous times to ventures which are considered not quite so hazardous as stock speculating and may be of more benefit to the country generally.

As long as prosperity continues, however, we are likely to see these speculative outbreaks. If they subside in one direction they will open up in another. The appreciation of values of stocks is usually the first accompaniment of improving times. A craze for stock speculation then develops and must run its course before it is dropped by the masses. They are next likely to turn their attention to real estate, and afterward to mining investments or to manufacturing propositions. But speculation in either of these lines is just as dangerous to the individual of limited means as stock speculation. Investments in improving real estate are desirable to most communities, and, as long as money is easy and business is active, such investments if judiciously made are fairly remunerative. But a taste of profit in a venture of this character invites more reckless investments when the public is in a proper mood and the real estate market is then overdone, leaving heavy burdens of debt on the shoulders of people, who stagger and finally fall under their load. The mining craze will probably come

along in due season, if prosperous times last long enough. Fabulous returns from small investments will tempt those who are scornful of the small though certain interest paid by savings banks, and they will buy reams of paper representing certificates of stock in mining companies. The speculative fever will not subside as long as men are earning good wages or salaries and feel that they can afford to take some risk.

It is to be hoped that the speculative proclivities of the people may not be diverted to any great extent into manufacturing lines. It is in this direction that serious injury can be inflicted, from which recovery may be slow. We have passed through several experiences of this kind in which promoters have selected industries temporarily very prosperous and organized stock companies of more or less pretensions. Numerous works have been built at such times which were purely speculative enterprises, having disadvantages in unfortunate locations, lack of sufficient capital, inexperienced management or faulty construction. Once built, such works have been factors of importance only in causing overproduction and unremunerative prices, ending in bankruptcy for themselves and the demoralization of the industry of which for the time they formed a part. Subsequently, they have constituted a menace to the trade, as they have induced persistent efforts on the part of misguided individuals to put them in operation. It would be far better for the iron industry, for instance, if the speculative spirit could be kept out of it completely. But this is expecting too much.

The pension system now in effect on some of the leading railroads is an admirable institution. It would be a most excellent thing if the principle could be made general, not only on railroads but in all other branches of business in which the great body of employees must continue to work at prevailing rates of wages without hope of advancement. This, however, is not to be expected. Those who see in the developments thus far made the promise that the system of pensioning employees will become general are, we fear, permitting their emotions to control their judgment. A few corporations may feel so certain of the future that they can tie themselves up with obligations of this character, but there are only a few. The others will continue to fight for existence as they have done, hoping to make enough profits in fat years to carry them through the inevitable lean years, and will be very prudent in adding to fixed charges any items which are not compulsory. For failing to provide a pension system it would be unfair to characterize them as selfish or heartless. But, on the other hand, those who do inaugurate such a system should be heartily praised for their action in thus cultivating better relations with their men.

The Amalgamated Association of Pittsburgh are trying to organize lodges in a number of iron and steel mills in the East. A lodge with about 125 members has been organized among employees of the Lackawanna Iron & Steel Company, at Scranton, Pa. A good many steel mills through the East that have not been running steadily for some years, are now able by reason of the prosperous condition of the iron trade, to operate their plants full time. A determined effort will be made by officials of the Amalgamated Association to organize lodges in many of these plants.

The Pittsburgh Steam Ship Company is the title of the corporation under which the fleet of the United States Steel Corporation will be operated. This was the name of the Carnegie fleet, which is now a part of the consolidation fleet, under the general management of Captain A. B. Wolvin.

The Mechanical Engineers' Meeting.

The forty-third meeting of the American Society of Mechanical Engineers will be held at Milwaukee, Wis., May 28 to 31. The following papers will be presented: Geo. A. Hutchinson, "The Practical Application of Superheated Steam;" E. H. Foster, "Superheated Steam;" F. O. Ball, "Drafting Room and Shop Systems;" H. G. Reist, "Blue Printing by Electric Light;" A. W. Robinson, "Rules for Drawing Office;" A. J. Rossi, "Influence of Titanium on the Properties of Cast Iron and Steel;" Wm. E. Reed, "A Few Instruments of Precision at the Paris Exposition of 1900;" Fred. J. Miller, "Bevel Gear Cutting Machines at Paris;" Storm Bull, "The Locomotive Exhibits at the Paris Exposition of 1900;" C. W. Hunt, "New Connecting Rod End;" Geo. H. Marr, "Method of Filing and Indexing Engineering Literature, Notes, Data, &c.;" John Riddell, "Portable *vs.* Stationary Machine Tools;" Wm. O. Webber, "A Filtration Plant at Albany, N. Y.;" William O. Webber, "Tests of an Hydraulic Air Compressor;" Bardwell & Hamilton, "The Bardwell Votometer;" Chas. H. Benjamin, "Some Experiments on Ball Step Bearings;" F. H. Stillman, "Pulley Press Valve;" J. I. Astrom, "Determination of Fly Wheels to Keep the Angular Variation of an Engine Within a Fixed Limit;" W. S. Russell, "A Special Form of Boring and Facing Machine;" C. H. Robertson, "Efficiency Tests of 125 Horse-Power Gas Engine;" J. R. Fordyce, "A Method of Preparing and Baling Cotton in Round Bales;" M. P. Wood, "Protecting Ferric Structures;" F. H. Daniels, "An Improved Type of Ingot Heating Furnace;" H. H. Supplee, "The Entertainment of the Visiting Engineers in Europe in 1900." During the meeting visits will be made to the works of the E. P. Allis Company, the Nordberg Mfg. Company, the Filer & Stowell Mfg. Company, the Vilter Mfg. Company, the Christensen Engineering Company, and the Bucyrus Company.

The American Steel Hoop Company.

At a meeting of the American Steel Hoop Company the following were elected directors:

C. M. Schwab,	J. J. Treacy,
E. H. Gary,	Hugh Kennedy,
D. G. Reid,	J. W. Jenks,
W. B. Leeds,	Severn P. Kerr,
F. S. Wheeler,	J. M. Bentley.
Veryl Preston,	

The following were elected officers of the company:
President, Veryl Preston.

Vice-president and general sales agent, Severn P. Kerr.

Treasurer, F. S. Wheeler.

The headquarters of the company will remain in New York at the Battery Park Building, while the operating department will be in Pittsburgh. Hugh Kennedy is manager of the furnace department, J. W. Jenks general superintendent of the rolling mills, and J. M. Bentley the auditor.

In regard to the purchase of the Willoughby Dock property by the Brier Hill Iron & Coal Company of Youngstown, Ohio, we may state that the concern bought this property, believing it to be a good investment. The price was cheap and the concern will probably utilize the property at some time in protecting their various interests. No railroad is in contemplation now, and there is no present intention of building a blast furnace or steel plant on the property. Various propositions have been made to the Brier Hill Iron & Coal Company relating to the property, but no attention has been paid to these.

Reports have it that the negotiations are drawing to a close for an arrangement between Vickers' Sons & Maxim of Sheffield, the Cramp & Sons Engine & Shipbuilding Company of Philadelphia and the Bethlehem Steel Company of South Bethlehem, Pa. The idea is to amalgamate these companies so that a battle ship may be built complete with armor, forgings and guns.

Conference of Labor and Capital.

Under the auspices of the National Civic Federation a number of representatives of capital and labor were brought together in New York on Tuesday and Wednesday, May 7 and 8, for the purpose of discussing the labor situation and especially to consider the report of the joint Committee on Conciliation and Arbitration of the Federation. The Federation is the outgrowth of the Civic Federation of Chicago and at present has its quarters in that city, but it is understood that it will shortly remove its head office to New York. The Committee on Conciliation and Arbitration is composed of between 30 and 40 employers and heads of labor unions. A subcommittee of the committee, consisting of Herman Justi, commissioner of the Illinois Coal Operators' Association; E. D. Kenna, vice-president of the Atchison, Topeka & Santa Fé Railroad, and John Mitchell, president of the United Mine Workers' Association of America, were appointed to formulate a plan of action looking to the abolition of friction between employers and employees and to do away with strikes and lockouts. This report was made on the afternoon of Wednesday at a secret meeting of the whole committee at the Cooper Union. Among those present at this meeting were: Adolphus C. Bartlett, vice-president of the Hibbard, Spencer & Bartlett Company of Chicago, chairman of the Civic Federation; Chauncey H. Castle, president of the Stove Founders' National Defense Association; G. Watson French, vice-president of the Republic Iron & Steel Company; Henry W. Hoyt, president of the National Foundrymen's Association; President W. J. Chalmers and Walter L. Pierce of the National Metal Trades Association; William H. Sayward, secretary of the National Association of Builders; W. H. Pfahler, treasurer of the Abram Cox Stove Company, Philadelphia; R. M. Easley, secretary of the National Civic Federation; Samuel Gompers, president of the American Federation of Labor; James O'Connell, president of the International Association of Machinists; Warren A. Reed, chairman of the Massachusetts Board of Conciliation; Bishop Potter of New York; Prof. Felix Adler and others. According to Secretary Easley the business men present represented a capital of about $1,000,000,000.

The sub-committees' report, which was discussed and referred back for amendment, was presented publicly at the meeting in Cooper Union on the following day. The report is as follows:

Purpose.

"The National Committee on Conciliation and Arbitration, created at a convention held in the city of Chicago, in December, 1900, under the auspices of the National Civic Federation, and clothed with authority by that convention to organize and formulate policies and measures and to enter into active service in the cause of peace and harmony in the industrial world, realizing that the prosperity of our nation depends upon the steady and profitable employment of the people; that when the workers are idle capital is idle, and the interests of employer and employee are imperiled, hereby announces and declares its purpose to be the prevention of those most threatening of all industrial disturbances, the strike and the lockout.

Scope.

"The scope or field of work of the National Committee on Conciliation and Arbitration is briefly described as follows:

"1. To form in the public mind the conviction that industrial disturbances in the nature of strikes or lockouts can and should be avoided.

"2. That the only reliable method of avoiding such disturbances is through full and frank conferences between employers and workmen, with the avowed purpose of reaching an agreement as to terms of employment. Trade agreements between employers and workmen, where established for a definite term, have so fully demonstrated their great value in maintaining industrial peace that they should be generally adopted.

"3. That under conditions existing to-day, and as they are likely to exist for the future, organizations suitable for comprehensive and conclusive consideration of those complex questions involved in the mutual relations of employers and workmen are most valuable and important, and where possible should be utilized, but in any event the true and safe policy is comprehended in conference and agreement between employers and workmen covering as large a constituency as possible, and

"4. That the surest way to keep organizations of employers and workmen free from unwise and injurious action is through co-operation and the mutual education and respect which will inevitably follow from it.

"To establish and maintain a board or commission composed of the most competent persons available selected from employers and employees of judgment, experience and reliability, which shall be charged with the above described duties, and shall also be expected to make known to workmen and employers that their counsel and aid will be available if desired in securing that co-operation, mutual understanding and agreement already indicated as the general purpose of this National Committee on Conciliation and Arbitration.

Method.

"The general method of operation only may be outlined; specific measures will have to be determined from time to time, as study, investigation and experience may show cause.

"The committee will secure the fullest possible information as to methods and measures of arbitration in vogue throughout the world; it will put itself into communication with all representative bodies of workmen and employers, inform them as to its purpose, offer its services and secure its co-operation and good will if possible, asking particularly of general organizations that whenever any specific questions are arising where there is no established method of joint consideration and settlement existing, the National Committee be informed in order that it may use its influence before trouble occurs. This method to be extended to local organizations when the committee may find itself sufficiently equipped to do so.

"The committee will adopt such measures as may seem feasible to disseminate through the general newspaper press, through magazines, periodicals and special pamphlets, the results of its investigations, together with its recommendations and suggestions."

An open meeting of the Committee on Conciliation and Arbitration was held on the afternoon of Wednesday in the assembly room of the Chamber of Commerce, A. C. Bartlett calling the meeting to order and introducing Samuel Gompers as chairman. In opening the session Mr. Gompers congratulated those present on the fact that capital and labor were beginning to understand each other better. The time, he said, had arrived for the adoption of some other means than brute force for the adjustment of the difficulties that arise in the industrial world. Industrial peace is necessary to industrial prosperity. President John Mitchell of the United Mine Workers' Association of America urged that if there had been a wholesome public opinion to enforce the principles which are advocated by the National Civic Federation, there would have been no anthracite coal strike.

Mr. Gompers then introduced Charles R. Flint of New York as "a walking delegate of the Rubber Trust." Mr. Flint spoke at length on the growing export trade of the country and the consequent employment of vast numbers of men. He believed that good results would follow the cultivation of intimate relations between employers and employees. Continuing, he said in substance: "Every captain of industry recognizes that his progress depends on the increasing intelligence of his workmen. The work that is being done in the cheap labor countries by manual labor is being performed in the United States by labor saving machinery, with the result that our productive capacity is greater than that of countries many times larger than ours. The American wage earner is raised to the dignity of an overseer, not over degraded humanity, but over a more reliable and effective slave—machinery. One danger to American industry is a possible conflict between capital and labor. Such a conflict would be disastrous to both. A meeting of this character is a wise step toward guarding against any possible misunderstanding which might threaten the greatest industrial evolution the world has ever known."

Daniel J. Keefe, president of the Longshoremen's Union, said that he believed in conciliation rather than arbitration. Arbitration could not be made compulsory in this country, and the finding of a board of arbitrators almost always left one side unsatisfied. Mr. Keefe reviewed the work of his union and said that when both sides to a controversy had come together for consultation it had almost invariably resulted in an agreement with-

out a strike. William H. Sayward of Boston, secretary of the National Builders' Association, testified to the fact that never had a workingman been known to violate an agreement to abide by the decision of a disinterested umpire. James O'Connell, president of the International Association of Machinists, and Herman Justi also spoke in favor of conciliation.

A mass meeting was held in Cooper Union on Thursday evening, May 8, its object being to explain to the public the aims and objects of the Federation. The meeting, which was presided over by Charles Sprague Smith of New York, was not as harmonious as might have been desired, a number of socialists of the extreme type having gained admission, frequently disturbing the proceedings by loud expressions of dissent.

John Mitchell, president of the United Mine Workers' Association of America, was the first speaker. Mr. Mitchell said that the purpose of the meeting was to show that if capital and labor would only discuss their differences in a friendly spirit strikes would not occur, and he expressed himself as ready to stand for peace in the industrial world. He stated that a plan had been agreed upon by the National Committee on Conciliation which, if it had been followed in past times, would have prevented all the strikes that have occurred in recent years. Dr. Felix Adler, who followed, said that when there are labor troubles the general public is shaken to its foundations. He believed that labor and capital should be on friendly terms, and that there were indications of a better feeling arising between them.

During the address of Samuel Gompers, who was the next speaker, the socialists took occasion to raise a considerable disturbance, volubly expressing their disagreement with the sentiments expressed. Mr. Gompers' remarks were directed toward the importance and value of arbitration and conciliation, a method in which he expressed himself as a thorough believer. He remarked that there was no proof of the correctness of the contention made in certain quarters that there cannot be any joint interest between employers and employees. His experience led him to conclude otherwise.

William Sayward of the National Builders' Association, and Commissioner Herman Justi of the Coal Operators' Association of Illinois, the last speakers, described what had been done by their respective organizations toward harmonizing the interests of labor and capital.

The exports of merchandise for the United States for the month of April were valued at $120,780,590, being an increase of $2,008,010 over those for the same month last year. For the ten months ended April 30 the exports were valued at $1,260,449,248, being an increase of $88,045,972 over those of the same period of the preceding year. The imports of merchandise in April aggregated $76,750,982, or $1,240,720 in excess of those in April, 1900. For the ten months ended April 30 the imports were valued at $676,236,942, or a falling off of $41,049,350 compared with those of the same period last year. The balance of trade in favor of the United States on foreign commerce during the ten months was $584,212,306, as against $455,116,984 in a like period of the previous fiscal year—a gain of $129,095,322.

The Carnegie Steel Company have stopped all work on the construction of the Monongahela Southern Railroad from the Union Railroad at Duquesne to Finleyville, Washington County, Pa.

Neal Brothers of Pittsburgh have leased the old cut nail works of Chess Brothers, on the South Side, Pittsburgh, and will install a bar mill and two tin plate mills.

The strike at the plant of the Tyler Tube & Pipe Company, Washington, Pa., has been settled and the works are now in full operation.

Five new lodges of the Amalgamated Association are being organized at Youngstown, Ohio.

The Wheatland Rolling Mills, at Wheatland, Pa., expect to be started Monday, May 27.

The Business Situation.

The *Financial Chronicle*, after reviewing the returns of pig iron statistics collected by *The Iron Age*, says:

In other branches of business the indications are of like character—that is, nearly everywhere there is evidence of activity and prosperity. Perhaps an exception should be made in the case of the cotton goods trade, where the decline in the price of the raw material coming at a time of large stocks of cloth has proved an unsettling influence. Outside of the textile trades, however, complaints are very few. That the volume of business generally is very large admits of no question. We will not refer to the weekly and monthly records of bank clearings for confirmation of the truth of this statement, as it is impossible to eliminate from such clearings transactions of a speculative character. But certainly returns of railroad earnings are good proof of what is going on. We publish to-day our compilation of the gross earnings of United States railroads for the month of April. This shows an increase of 8.94 per cent. over the same month last year. We also give a statement for the fourth week of April, recording 15.75 per cent. gain. The important point in connection with this improvement is that it is continuous—that is, that it follows successive increases in the years preceding; in 1900, for example, there was an increase of no less than 12.11 per cent. for the fourth week and of 12.69 per cent. for the month of April. The records of mercantile failures are also highly gratifying; they betoken that not only is the volume of business large, but that it is profitable. According to *Dun's Review*, the number of failures for April was a little larger than for that month last year, the comparison being 763, against 707, but the liabilities aggregated only $5,571,222, against $9,761,869. Even in 1899, the year of lowest mercantile death rate since 1881, the amount of the liabilities was $5,790,096, the number of failures then being 666. As indicating how much below the ordinary the present total of 763 failures with $5,500,000 liabilities is, it is only necessary to note that in April, 1894, there were 1050 disasters with $13,336,404 liabilities; in 1895, 999 with $10,966,459 liabilities; in 1896, 1000 with $12,487,697 liabilities, and in 1897, 941 with $17,613,477 liabilities.

The De Dion-Bouton Motorette Company, Brooklyn, N. Y., have recently installed a private nickel plating plant. This equipment comprises a number of novelties of interest. The dynamo is driven by a 3½ horse-power water jacketed De Dion motor (belt connected). The gasoline tank is placed just above the motor, the vaporizer occupying its usual position to the left. The exhaust is fitted to a standard 3½ muffler placed outside, connected by a steel tube. The water jacket is connected to the regular water main via a ⅝-inch copper tube. Two vats are already in place and doing service, but provision is being made for several others. Those now used are of different sizes, the larger vat being 6 feet long by 28 inches in width and 18 inches in depth. The smaller vat is 4 feet long by 18 inches wide and 16 inches deep. It is not generally known that the Motorette works are driven by a gas motor, but such is the case. This engine is of 25 horse-power, and a similar one reached the works last week and will be installed at once. This plan of equipping the plant with gas engines follows a similar custom at the De Dion Works in Puteaux, France, where 3000 men are employed.

A new company have been organized in Pittsburgh to build a large steel hoop and bar mill plant at Monessen, on the Monongahela River, near Pittsburgh. The new concern will apply for a charter in a few days.

The Duquesne Forge Company, Rankin Station, Pittsburgh, are drilling wells trying to get a supply of pure water for their boilers, in order to avoid the use of water from the Monongahela River, which is full of acid and very destructive to boilers.

Large Orders for Lap Welded Steel Pipe.

The National Tube Company, Conestoga Building, Pittsburgh, have taken a contract from the Spring Valley Water Company for two lines of 22-inch outside diameter, ⅜ inch thick, lap welded steel pipe, ends to be connected with ball and socket joint, which will be used by the Spring Valley Water Company in piping water from the Sierra Nevada Mountains across the bay to San Francisco. The lines will be laid on the bottom parallel with each other, and there will be two lines laid so that if anything happens to one they will have the service of the other. These lines are about 6500 feet long. The Spring Valley Water Company are a corporation who supply the city of San Francisco with drinking water.

The National Tube Company have also taken an order for about 8 miles of 7 and 8 inch Converse joint lap welded steel pipe for additional water supply for Santa Barbara, Cal.

A contract has also been received by the National Tube Company, and which will be executed at their seamless tube plant at Christy Park, near McKeesport, for 13,000 seamless steel tubes, to be used in Niclausse boilers, being built by the Sterling Company of Barberton, Ohio, for a new line of steamships for the Pacific Coast trade. These are being built by the Eastern Shipbuilding Company, at New London, Conn., for one of the J. J. Hill companies. These ships are said to be the largest freighters ever built, having a displacement of about 25,000 to 30,000 tons.

Jones & Laughlins' New Additions.

Plans are under way by Jones & Laughlins, Limited, of the American Iron & Steel Works, Pittsburgh, by which the capacity of their works will be very much enlarged. It will be recalled that a short time since this firm made arrangements with the owners of the Talbot patents to install two Talbot basic open hearth furnaces in their mills, and work on these will be commenced in a short time. There will be two 200-ton furnaces, which are expected to turn out 600 tons of steel every 24 hours. At the present time Jones & Laughlins have six basic open hearth furnaces, each of 40 tons capacity, and three acid furnaces of smaller size. They also have a large Bessemer plant, their total output of steel at the present time being about 2200 tons per day. They operate three blooming mills, and it is their intention to tear out No. 1 mill, which was built in 1884, and replace it with a more modern 40-inch blooming mill, which will roll 9 x 7 ingots. Back of this mill will be a 26 or 28 inch finishing mill, which will roll a variety of products, consisting of rails, billets, sheet or tin bars. This mill will probably, when pushed, be able to turn out 2500 tons of finished steel per day. Engines to drive both mills will be furnished by the William Tod Company of Youngstown, Ohio, while Julian Kennedy, the well-known consulting engineer, of Pittsburgh, is drawing the plans. Work on the installation of these mills will be started in a short time, and they will be pushed to completion as fast as possible.

When this new blooming mill and the two Talbot furnaces have been installed Jones & Laughlins will be able to turn out from 4000 to 4200 tons of steel per day. The fourth Eliza Furnace of this firm on Second avenue, Pittsburgh, was blown in last week, and there is no doubt but that Jones & Laughlins have the distinction of having the finest blast furnace plant in the country. There are four furnaces, each capable of turning out 600 tons or more when in good running order. To take care of the increased steel output when the improvements noted above have been made, it will be necessary for Jones & Laughlins to build one or two more blast furnaces, but this will be taken up at some future time. With their steel capacity running up to 4000 tons a day or over, and their pig capacity running up to 2700 tons a day, the firm will be buyers of metal in the open market.

The rod mill which has been under construction by this firm for some time is about finished and will be started in a few days. It is expected to turn out about 300 tons of rods per day. The large beam mill recently started by Jones & Laughlins is turning out about 450 tons daily. This mill can roll beams up to 24 inches. Jones & Laughlins are particularly well equipped, having their own coal, coke and ore properties, and also their own blast furnaces, making them independent of the open market.

PERSONAL.

Harry R. Hall, formerly manager of the Carbon and later of the Watts furnaces, is the representative of the Wellman-Seaver Engineering Company in the remodeling of a furnace on the Pacific Coast.

George W. Hamilton of Johnstown, Pa., has accepted a responsible position at Sault Ste. Marie, Canada, where new steel works are being erected. David D. Lewis, formerly of Johnstown but later of Lorain, recently resigned his position with the Lorain Steel Company to take a position in the same works at the Sault.

Chas. M. Schwab, president of the United States Steel Corporation, has offered to build a new manual training school at Homestead, to cost from $50,000 to $75,000. About four years ago Mr. Schwab gave money for the starting of a manual school in the public school of Homestead, and the success of this has induced him to provide funds for the erection of a large manual training school building.

Philip Davies, foreman of the 40-inch mill at the Duquesne Steel Works, was presented last week with a gold watch by Jos. E. Schwab, general superintendent. Some time ago Mr. Schwab informed Mr. Davies that if the record of the mill for one month was beaten he would present him with a gift. As noted last week, this mill turned out in April 26,752 tons, beating the best previous month's record by 4000 tons.

C. P. Burgess, cashier in the Republic Iron & Steel Company's Southern district office, at Birmingham, has resigned to become secretary and treasurer of the Anniston Rolling Mill Company, at Anniston, Ala.

H. F. Westcott has been appointed general manager of the plant of the Southern Car & Foundry Company at Binghampton, Tenn., in the place of W. E. Fuller, resigned.

C. H. Danks, formerly district master mechanic of the Republic Iron & Steel Company, with headquarters at Muncie, Ind., has been appointed master mechanic of the Highland Iron & Steel Company and will superintend the construction of the plant which the company are erecting at Terre Haute, Ind.

Andrew Welsh, formerly assistant master mechanic of the Ohio Works of the National Steel Company, at Youngstown, Ohio, has resigned and has been made master mechanic of the Bessemer plant of the Republic Iron & Steel Company, at Youngstown.

W. H. Creahan, formerly with the American Steel Hoop Company, Warren, has resigned and has been made superintendent of the pipe mills now building by the Youngstown Iron, Sheet & Tube Company, at Youngstown, Ohio.

D. E. Park, the steel manufacturer at Pittsburgh, has been elected a member of the Board of Directors of the Union Trust Company, in that city. Mr. Park is also vice-president of the People's National Bank in Pittsburgh. Frank J. Hearne, president of the National Tube Company, is also on the board of the Union Trust Company.

Granville Kimball, manager of the Chicago branch of the Springfield Boiler & Mfg. Company, Springfield, Ill., and Lieutenant Commander and Chief Engineer of the Naval Militia of the State of Illinois, has gone to Philadelphia with a party, who are to bring to Chicago the United States ship "Dorothea," which has been loaned to the Illinois Naval Militia.

Taylor Alderdice, who retires from the management of the National Tube Company's plant at McKeesport,

Pa., was presented with a diamond studded watch by the employees of the plant.

William H. Johnston has resigned the position of secretary and treasurer of the Girard Boiler & Mfg. Company, Girard, Ohio, in order to accept a position in the Andrews Works of the Republic Iron & Steel Company, at Hasleton, Ohio.

E. C. Wiley has established himself as consulting mechanical engineer at Lynchburg, Va. Mr. Wiley was formerly mechanical engineer of the Glamorgan Pipe & Foundry Company and later designed the hydraulic jib cranes for the Radford pipe works of the Virginia Iron, Coal & Coke Company, having charge of the entire hydraulic plant.

Theo. F. Patterson is the manager of the office of E. B. Leaf & Co., at Danville, Pa.

President Vincent Ferrara and Treasurer C. de Tarnava of the Compania Fundidera de Fierro of Acero of Monterey, the largest steel plant in Mexico, are visiting this country with the object of purchasing the machinery and equipment for contemplated extensions to their works.

John W. Gates sailed for Europe on the "St. Louis" on Wednesday.

J. K. P. Miller, chief engineer of H. C. Frick Coke Company, has resigned, to take effect June 1, to become chief engineer and general manager of J. W. Ellsworth Company, operating extensive coal mines in the Monongahela Valley.

H. E. Tener, formerly with the Carnegie Steel Company, has been elected treasurer of the American Cotton Company of New York City. Mr. Tener resigned from the Carnegie Steel Company about six months ago, in order to take a long rest to build up his health. He had been connected with the concern for 12 years, and was closely associated with A. C. Case, who resigned some time ago to become president of the American Cotton Company. Mr. Tener will remove to New York.

The Oliver Iron Mining Company.—The Oliver-Snyder Company having disposed of their one-sixth interest in the Oliver Iron Mining Company to the United States Steel Corporation, Henry W. Oliver and George T. Oliver retired from active participation in the affairs of the Oliver Iron Mining Company at a meeting held in Pittsburgh last week. T. F. Cole, who was formerly general superintendent of the company, succeeded Henry W. Oliver as president, and was also appointed general manager. Dr. Nelson P. Hulst, the former general manager, becomes vice-president and general mining engineer. This is in line with other changes in the Steel Corporation, in having the president closely identified with the operating branch of the business. Dr. Hulst, who is an expert in all matters relating to the mining of iron ore, retires from the operating end of the business in order to devote his whole time to general questions, and to take up new lines of work which are the natural outgrowth of the amalgamation of such large mining interests. W. J. Olcott, superintendent of the Lake Superior Consolidated Mines, was elected a director of the Oliver Iron Mining Company.

At Zanesville, Ohio, the answer of the Eastern Tube Company to the injunction suit of the National Tube Company, in which the latter concern seek to enjoin the Eastern Tube Company from using patterns or machinery which it is alleged were surreptitiously removed from the pattern room of the Pennsylvania Tube Works, in Pittsburgh, was filed at Zanesville on Monday, May 13. The answer denies that the Eastern Tube Company had any knowledge that the patterns from which the machinery was made were taken from the mill in Pittsburgh, and is supported by the affidavits of C. E. Corbett, Harry Nuttall, Joshua Nuttall, E. H. Kenyon, W. M. Wolfe, W. Wolfe and J. B. Early, all of Pittsburgh. These affidavits declare in substance that the designs of the patterns taken are not trade secrets, and not, therefore, stolen from the National Tube Company, but matters of common knowledge to all those thoroughly versed in tube mill construction.

Trade Publications.

Wood Working Machinery.—A very complete catalogue has been prepared by the Defiance Machine Works of Defiance, Ohio, descriptive of their many types of wood working machines. They describe first the Seymour patent rotary balancing machine, which is intended for the purpose of perfectly balancing pulleys, fly wheels, car wheels and other rotating parts of machinery. A complete list is presented of their solid and split balanced pulleys. The machines described consist of hub roughing, finishing and mortising and boring machines, hub equalizing saws, automatic copying lathe, spoke and handle lathes, tennoning, mitering and pointing machines. Their automatic spoke throating machine is used by spoke, wheel and wagon manufacturers to rapidly and accurately throat both sides of spokes at one pass through the machine. It will cut any shape of throat desired at the rate of 15,000 per day. Their belt polishing machine is designed for polishing spokes, whiffletrees, handles and various other kinds of wood work which require a high finish. The first four pages are taken up with portraits of the president, secretary, general superintendent and treasurer of the company, Peter Kettenring, the founder of the business, and Wm. A. Kettenring, Ransom P. Kettenring, Chas. H. Kettenring, respectively; these are followed with a bird's-eye view of the company's plant, and a dozen finely executed half tones illustrating interiors of their offices and works. The book is issued in four different languages—viz., English, French, German and Spanish, and is especially valuable to their foreign customers.

Steel Works Machinery.—An elaborate catalogue, splendidly illustrated and beautifully printed, has been prepared by the Wellman-Seaver Engineering Company of Cleveland, Ohio. The first portion of this considers the *personnel* of the company and describes the several departments into which the work is divided. Views are presented of the open hearth steel plant of the American Steel & Wire Company's works at Cleveland, showing four 50-ton Wellman rolling open hearth furnaces; also view of the steel works and rolling mills of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., which were constructed by this company. There are engravings of the steel casting plant of the Shickle, Harrison & Howard Iron Company at East St. Louis. Views are shown of a 44-inch blooming mill, and hydraulic bloom, shear and ingot handling machines. The latter machine is used for taking large octagon ingots weighing from 1000 to 7000 pounds from a continuous heating furnace to the steam hammer and holding them under the hammer. The machine stands in a circular track, and, as the furnace is at right angles to the hammer, the movement is simply turning on its center. The part carrying the tongs has a longitudinal movement. The tongs also have an independent vertical and revolving movement. All movements of the machine are made by electric motors. The work of this company in the open hearth furnace line has been very extensive, dating back from the first successful open hearth furnace built in this country for the Bay State Iron Company of Boston. Nearly all of the stationary furnaces of to-day in the United States are modeled from the open hearth furnaces of the Otis Steel Company, which were designed and built by S. T. Wellman, president of the company. Their latest and most improved type of stationary furnaces has new and improved features, which extend the life of the furnace and cut the cost of repairs to a minimum. They have designed and are building furnaces using fuel oil, natural gas and producer gas, meeting the requirements of each class of fuel successfully. The Wellman rolling melting furnace, which is now being largely adopted as the leading type of steel melting furnace, has been constructed in capacities ranging from 3 tons to 100 tons per heat. The Wellman patented charging system and apparatus for open hearth furnaces have been supplied to all the leading steel works in America and to a number in Europe. The company have the exclusive right to manufacture in the United States and Canada the Fraser-

Talbot mechanical gas producer. Besides building a general line of standard overhead traveling cranes, the company have given a great deal of attention to designing and constructing cranes for special requirements, such as gantry or leg cranes, traveling on surface tracks; cantilever cranes, special cranes for pipe works, shipyards, &c. They make a specialty of the design and superintendence of the construction of complete blast furnace plants, including the installation of hoisting machinery for handling stock. Coke oven machinery is also considered in the book.

Aluminium-Zinc Alloys.

BY DR. JOSEPH W. RICHARDS.*

Many contradictory statements have appeared regarding the properties of aluminum-zinc alloys; and since these statements were all apparently made in good faith, the divergent accounts are probably to be ascribed to the use of impure aluminum or impure zinc, or to a lack of the knowledge of how to properly alloy the pure metals. In fact, the experience gained in the practice of alloying enables one to continually obtain better and better results, such as are wholly unattainable to the unskilled metallurgist.

Tissier Brothers, in the first book written about aluminum, describe the alloys of 1 part of aluminum with 2, 3 and 10 parts of zinc. They found these to be brittle, looking like zinc, fine grained and more fusible than aluminum, but less so than zinc. These alloys were used at first in attempts to solder aluminum, but they would not run liquid, and made poor looking joints. Aside from this, the alloys had no mechanically useful properties. My own experience confirms these statements. Out of eight alloys, which I have made, containing 2, 3, 4, 5, 6, 7, 8 and 9 parts of zinc to 1 part of aluminum, with specific gravity from 4½ to 6, there appears to be none with any specially valuable mechanical properties. Even the alloy of 1 part aluminum to 1 part of zinc, with a specific gravity of 4, may be classed with the above alloys. Alloys containing more aluminum than zinc first commence to possess valuable properties.

The alloy of 2 aluminum to 1 of zinc, containing 33 1-3 per cent. of zinc, is a remarkable alloy. W. F. Durand has described it (*Science*, 1897, p. 396) as being "equal to cast iron in strength, melts about 800 degrees F. (425 degrees C.), does not readily oxidize, takes a fine finish, perfectly fills the joints of the mold, and is, like cast iron, brittle, but resists corrosion well." After several years' experience with this alloy, commencing in 1895, I can substantiate the general correctness of Durand's statements, and add to them the following observations:

Experience in making this alloy has led to considerable improvement in the results obtained. The first samples made were just about equal to cast iron in strength, tests showing 18,000 to 24,000 pounds breaking strain per square inch, with no perceptible elongation; but at present there is no difficulty in reaching a tensile strength of 40,000 pounds, in castings. It resembles closely in its characteristics a high carbon steel, being extremely rigid, slightly elastic and breaking short with a fine grained fracture. It works well under the tools, in turning or boring, not requiring lubrication. It is the hardest and strongest of the valuable alloys of aluminum and zinc, takes a high polish and keeps its color very well. It is not so resistant to shock as the other alloys containing less zinc. Its specific gravity is 3.8, and calculation shows the remarkable contraction of 17 per cent. taking place during the alloying of its ingredients, which suggests the cause of its great strength. Numerous uses for this strong, rigid alloy will suggest themselves to every mechanical engineer.

The alloy of 3 parts aluminum to 1 part zinc, containing 25 per cent. of zinc, is the most generally useful of all the aluminum-zinc alloys. It is softer than the previous alloy, has a tensile strength of 35,000 pounds per square inch, and elastic limit nearly the same, with a slight elongation before breaking. It is, therefore, not a malleable alloy, but yet it is not brittle, for it bends slightly before breaking. This quality is a valuable one, for it enables one to straighten out a casting to a certain extent under the hammer. Remarkably clean and sharp castings can be made with it, when experience has been attained with the proper gating of the mold and the exact temperature of casting. As with all these alloys, overheating in the crucible must be scrupulously avoided, as well as the use of iron stirring implements, since oxide or dross does not separate out of the metals easily, and may thus get poured into the mold and injure the casting. Its specific gravity is 3.4, and the contraction taking place during alloying is, therefore, 14 per cent., which indicates a close and intimate combination. This alloy, when properly made from the pure metals, is all that could be desired in its working qualities, being equal to the finest brass in the lathe, under the drill, and in not clogging the file. It casts sound, takes a high polish, and has as fine a color as the best aluminum. It is not so hard and short as the 33 per cent. zinc alloy, nor quite so strong, but has supplanted it for most purposes because of its better working qualities and greater reliability under shock. It is at present in use for scale beams, surveying and astronomical instruments, light machine parts, gear wheels cut from blanks, cash registers, calculating machines, testing machines, indicator drums, surgical appliances, cases and parts of pneumatic tools, &c. It is nonmagnetic, and therefore particularly useful in scientific instruments. The use of this alloy is increasing rapidly, and it bids fair to be the most generally useful of the light aluminum-zinc alloys.

Below 25 per cent. of zinc the strength and hardness of the alloys decrease rapidly, and when the zinc is 15 per cent. or less the alloy can be forged, rolled or drawn. The alloy with 15 per cent. of zinc has in castings an elastic limit 16,000 pounds per square inch, tensile strength 22,330 pounds, elongation in 2 inches 6 per cent., and reduction of area 10½ per cent. It can be rolled and drawn into wire if frequently annealed. Mechanical tests of this alloy after working have not yet been made.

The alloys with less than 15 per cent. of zinc become softer and weaker, roll and draw well, but require lubrication of the tools during working. They may find application for special purposes where the previously mentioned alloys are too hard.

The Delaware Metal Refinery of Philadelphia has for some years made a specialty of the aluminum-zinc alloys, bringing to the subject their wide experience in the alloying and handling of the white metals. Their special aluminum-zinc alloys are made under the supervision of Joseph Richards, and sold as Richards' Hardened Aluminum.

The Aluminum World.

Vice-Chancellor Emery, at Newark, N. J., signed a final order last week confirming the sale of the Rogers Locomotive Works, at Paterson, to Elliott C. Smith and Frank Hoiran, who two weeks ago submitted an offer of $602,000 for the court's approval. When the confirmation proceedings came up an effort to have the option disregarded and a new offer made on behalf of the International Power Company considered was made by Judge J. S. L'Amereau, the attorney for the International Company. He had $150,000 in new and crisp gold certificates to deposit as surety for the sincerity of his offer of $655,000. The Vice-Chancellor held that he believed the best interests not only of the Rogers Stockholders but of the general public would be served by the acceptance of the Smith-Hoiran bid. It appeared to be made in good faith. The International Power Company's bid was withheld until the last moment, and while he believed it to be genuine he considered the company remiss, and would confirm the tentative sale. The Smith-Hoiran syndicate now own the Rogers Works, as the papers were all ready and the transfer was at once effective.

The Columbus Insulated Wire & Brass Company, Columbus, Ohio, have incorporated with a capital stock of $15,000 to manufacture and sell insulated wire and electrical appliances. The incorporators are Joseph Schanthal, Nelson J. Ruggles, John J. Reilly, Francis M. Shipley and Gilbert M. Stewart.

MANUFACTURING.

Iron and Steel.

A readjustment of wages has been made in the open hearth mill No. 2 of the Homestead Steel Works of the Carnegie Steel Company, at Homestead. The change was made on account of an addition of four new furnaces to the department, and the putting in of new equipment which will materially increase output. Charging machine, 33 cents a ton; narrow gauge engineers, 17 cents; hook-on men, 16 cents; ladle men, 16 cents; crane men, 16 cents, and pit men, 16 cents. The furnace tenders' scale was not changed. While it would seem that the men's wages have been lowered, yet by reason of increased output of the plant it is expected the men will be able to make as much as before the reduction was made.

The Princess Furnace of Glen Wilton, Virginia, was blown in the last week of April.

A meeting of the creditors of the Continental Iron Company was held in Warren, Ohio, on May 7. A new advisory board was elected, consisting of J. M. Bailey, A. M. Byers, Jr., Dewitt Wilson of Pittsburgh, Henry B. Shields of Youngstown and W. D. McCaffrey of Leetonia. James A. Campbell, trustee, resigned and R. S. Henderson of Cleveland was chosen trustee and given authority to improve and operate the Wheatland Rolling Mill.

Zug & Co., Limited, at Pittsburgh, makers of fine steel sheets, have just finished building two more sheet mills, giving that concern a six-mill plant. They will be able to turn out about 50 tons of sheets per day.

The Youngstown Mfg. Company have been organized at Youngstown, Ohio, with a capital of $300,000, and will make rivets, bolts and nuts, and other iron and steel products. The concern are composed nearly altogether of Youngstown capitalists. Among those interested are C. H. Booth of Lloyd Booth Company, and Robert Bentley of the Ohio Iron & Steel Company, at Lowellville, Ohio. It is probable a large plant will be built by the new concern in Youngstown.

The injunction proceedings of A. F. Baumgarten of Pittsburgh against the Schonthal Iron & Steel Company, operating the Cumberland Rolling Mills, at Cumberland, Md., have been discontinued, a settlement having been made out of court. Mr. Baumgarten was interested with Jos. Schonthal in the original plans to operate the Cumberland Rolling Mills for the receiver of the Potomac Steel Company, but later the Schonthal Iron & Steel Company were organized and took control. The nail department of this plant has been fixed up, and is now running. It may also be noted that the partnership heretofore existing between Jos. Schonthal and A. F. Baumgarten, dealers in iron and steel scrap, at Pittsburgh, has been dissolved.

The American Rolling Mill Company, Rookery Building, Chicago, started their bar and guide mills at Muskegon, Mich., on May 7. This is the old Champion plant, recently acquired by the company named. They will hereafter operate rolling mills at Muskegon, Mich., and Muncie, Ind.

The new plant of the Crawfordsville Wire & Nail Company, Crawfordsville, Ind., began operations May 6. They have ten nail machines with a capacity of 150 kegs per day. The company hope to have their wire drawing plant in operation early in the fall.

The American Steel & Wire Company took possession last Thursday of the Granite City Wire Mill at Granite City, Ill., recently operated by the Merchants' Wire & Nail Company. The latter company had held possession of the mill through a lease given them by the receiver, which has now been terminated. The American Steel & Wire Company are large holders of bonds executed by the old owners of the plant on which foreclosure proceedings had been instituted, and the date for redemption having passed they were able to get possession of the property.

A third heating furnace has been installed at the Howard Axle Works of the Carnegie Steel Company, at Howard Station, Homestead. This will give a capacity of about 500 tons more axles per day, making the total output of these works 1500 tons of hammered axles every 24 hours.

A movement is on foot to establish a blast furnace and steel plant near Detroit, Mich. Zug Island, where coke from the new ovens of the Solvay Process Company can be delivered at a cost of practically nothing, is the probable location.

The price for puddling in the mills of the E. G. Brooke Iron Company, Birdsboro, Pa., has been advanced from $3.25 to $3.50 a ton, with proportionate increase to all the employees in this department, taking effect May 15.

Samuel S. Shomaker of Saltsburg, Pa., and Alexander Shomaker of Dennison, Ohio, who built the Saltsburg Rolling Mills, at Saltsburg, Pa., afterward sold to the American Sheet Steel Company, state that they may possibly build another sheet mill in the Pittsburgh district.

The stockholders of the Hussey Steel Company, operating bar and cold rolled steel mills at New Kensington, Pa., met in Pittsburgh on Monday, May 13, and increased the capital stock from $150,000 to $250,000. The additional capital will be used in making extensive improvements.

Machine Tools.

The plant of the Fifield Tool Company, at Lowell, Mass., consisting of a main building 60 x 250 feet, 2½ stories; two ells 60 x 120 feet, two stories, and an addition 43 x 120 feet, was completely destroyed by fire last week, entailing a loss of about $200,000, with insurance of about $125,000. The company manufacture engines lathes. Though no plans as to the future have as yet been made, it is probable that they will rebuild. George W. Fifield is president and general manager and John J. Donovan secretary and treasurer.

The Becker-Brainard Milling Machine Company of Hyde Park, Mass., exhibit in Block 44, Machinery Hall, at the Pan-American Exposition the following distinctive types of machine tools: No. 5 B vertical spindle milling machine, driven by direct connected eight-pole variable speed motor; No. 5 B plain horizontal milling machine in operation; No. 14½ tool room universal milling machine; 24-inch complete automatic gear cutter in operation; No. 3 cutter grinder in operation. These machines are selected to represent, as fully as the limited space will permit, the principal lines of tools manufactured by this company. They only give an idea of the extent and variety of designs which their unsurpassed facilities enable them to furnish. The Becker-Brainard works are now the largest in the world devoted to the exclusive manufacture of milling machines, having just been entirely remodeled and equipped with improved tools.

The Alcorn Machine Company, Waltham, Mass., recently incorporated, have succeeded to the business formerly conducted by Alcorn & Ames, and will continue the manufacture of precision bench lathes, punches and dies and special machinery. John S. Alcorn is president.

General Machinery.

The American Copper, Brass & Iron Works, Michigan street and La Salle avenue, Chicago, have been awarded the contract for a complete beet sugar plant to be erected at Salzburg, Mich.

The Vulcan Iron Works, Chicago, have received an order for 16 gas burners and a number of 30-inch blast gates from the Illinois Steel Company, Chicago; for a large number of cast iron gates for coal chutes from the Copper Range Railroad Company, Houghton, Mich., and for several steam pile hammers from the Lake Shore & Michigan Southern, Atchison, Topeka & Santa Fe, and Gulf & Ship Island railroad companies.

The Kennedy Valve Mfg. Company, 58 Beekman street, New York City, are building a two-story addition to their plant at Coxsackie, New York.

At a meeting of the directors of the New Haven Iron & Steel Company, New Haven, Conn., the board authorized the president, C. C. Kauffman, to close the contracts for machinery, &c., thus increasing the capacity of the plant by about 1000 tons per month.

The Union Machine Company, 130-132 Main street, San Francisco, Cal., recently incorporated, have taken over an existing plant and will continue the manufacture of brewers' and maltsters' machinery, &c.

The Braddock Machine & Mfg. Company, Braddock, Pa., have received a contract for the erection of a six-mill tin plate plant in Milwaukee, Wis. The parties who placed the contract have the option of placing 12 more mills, which, if exercised, will make an eight-mill plant to go up in that city. The Braddock Machine & Mfg. Company have ready for shipment the new sheet mill plant for the Youngstown Iron & Steel Roofing Company, at Youngstown, Ohio. The equipment includes a bar mill, two roughing mills, four sheet mills and one cold mill; also squeezers, shears and all other equipment necessary to make a complete sheet plant. Exceptionally quick time was made in the building of this sheet mill, they having received the contract in January and practically completed it in less than four months. At the time they received the contract for these sheet mills, the Braddock Machine & Mfg. Company did not have a blue print, pattern or anything else on which to start work. This concern have just placed contracts for an addition to their foundry of 100 feet, and also to their machine shop of the same size. They are adding considerable equipment to their foundry and also some large tools in their machine shop. They are also putting in two more 20-ton electric traveling cranes, furnished by the Northern Engineering Works, Detroit, Mich. They have a great deal of work on their floor and are running their foundry and machine shops to full capacity.

J. J. Ryan & Co., brass founders and finishers, 68 to 74 West Monroe street, Chicago, have installed a number of new machine tools, consisting of lathes, screw machines, planers, &c., increasing their capacity 25 per cent. They have also equipped an air plant, and their tools will be operated by compressed air, enabling them to turn work out more rapidly than heretofore.

Olsen & Tilgner, millwrights and machinists, 37 and 39 Ontario street, Chicago, have secured contracts for complete brewery outfits for the Seattle Brewing Company, Seattle, Wash.; Pilsener Brewing Company, Cleveland, Ohio; Dyersville Brewing Company, Dyersville, Iowa, and the Illinois Malting Company, Chicago. The firm are increasing their facilities to meet the growth of their business.

Among recent incorporations in Illinois are the C. F. Sparks Machine Company, Alton, with a capital of $5000, to manufacture machinery, the incorporators being C. W. Sparks, W. A. Stanard and Samuel Plant.

The mortgagees of the business of Barron Bros. & Co., are operating the plant at Fremont, Wash., under the name of the Pacific Iron Works.

John Rourke & Son, Savannah, Ga., iron and brass founders and machinists, blacksmiths and boiler makers, are building a marine railway to be used in connection with their works. By means of it facilities for the repairing of vessels will be greatly improved, the vessels being run out of the Savannah River and placed alongside their shop on dry land. The arrangement is equivalent to that of a dry dock, as every part of the vessel can be examined and repairs required made accordingly. Business with the firm was very satisfactory during the whole of 1900, and while it slackened in the first months of this year it has again become very brisk.

American Engineering Works of Chicago have recently received a number of export orders for mining and industrial cars, to be equipped with their patent Anaconda wheels and axles. These orders have been from England, Japan, Mexico, British Columbia and Alaska. This company are also filling a number of export orders for shells for crushing rolls, made from their special A. E. W. steel.

The Cameron & Barkley Company, Charleston, S. C., dealers in machinery, are building an additional warehouse opposite their main building on Cumberland street. It has a frontage of 125 feet and is 115 feet deep. It is to be used for the storage of engines, boilers, heavy machinery, pipe, &c. Their main building consists of three floors. They have recently fitted up a pipe machine manufactured by the Jarecki Mfg. Company, Erie, Pa., that will cut and thread 12-inch pipe, which is said to be the largest one in use in the State. They are also about to add machinery for boring pulleys, sprocket wheels and key seating shafting. Business with the company at present is satisfactory and the outlook favorable.

The Webster, Camp & Lane Company of Akron, manufacturers of hoisting and conveying machinery, are preparing to reorganize their company. The capital stock will be increased from $100,000 to $300,000. A large plant will be erected in South Akron which will be devoted to the production of heavy mining machinery. It is stated that the present plant will be continued on present lines and will be operated in connection with the new plant.

Engines and Boilers.

The National Boiler Works, Chicago, have secured contracts for one 150 horse-power boiler for the Chicago & Northwestern Railway Company, for the shops at Ashland, Wis.; three 125 horse-power boilers for the Chicago & Western Indiana Railroad Company, and three of the same kind for the Skink Coal Company, Chicago.

Besides the 130 x 100 foot addition to the boiler plant the Aultman & Taylor Machine Company of Mansfield, Ohio, are building an addition to the office and may make some further additions during the year. The company report business for this year to be nearly 150 per cent. in excess of any previous year.

Among recently organized Missouri corporations are the Stuart Boiler Company, St. Louis, with a cash capital of $60,000. The company will manufacture special internally fired boilers, special tanks, and the new Schwartz cupolas for melting brass, malleable iron or steel. A site for a plant has not yet been selected, but plans have been completed for a main building, 150 x 300 feet, and a smaller one which will comprise the engine house and blacksmith shop. The officers of the new company are: President, S. T. Blyer; vice-president and treasurer, M. Judd, late American consul at Vienna, and secretary and manager, N. B. Stuart, formerly of the John O'Brien Boiler & Sheet Iron Works, St. Louis.

The Hawley Down Draft Furnace Company, Townsend and Superior streets, Chicago, have recently secured contracts for four 300 horse-power furnaces for different municipal light plants in Chicago, 20 furnaces to be shipped to various mills in Wisconsin, and 14 300 horse-power furnaces for the United States Electric Light & Power Company, Washington. The company have added several large machines to their shop equipment, which have increased their capacity 25 per cent. They have also decided to manufacture steel castings for their own use, and plans are now being considered for improvements which will enable them to do this.

Charles D. Parker has associated himself with A. Burlingame Company, manufacturers of automatic engines, shafting, iron and wood pulleys, &c., at Worcester, Mass. The company are about to put on the market a new design of Corliss engine which will be entirely modern and built in a strictly first-class manner.

M. Rumely Company, La Porte, Ind., manufacturers of traction engines, separators, thrashing machines, agricultural implements, &c., have transferred their warehouse from Cedar Rapids to Des Moines, Iowa, where they have secured several buildings. It is the intention of the company to erect a new warehouse at a cost of about $75,000 in the near future.

The Valk & Murdoch Iron Works, Charleston, S. C., report they are quite busy in all departments, having contracts on hand for two large cylinder washers and gearing; five large internal fired boilers, 150 horse-power capacity each, and one of 80 horse-power capacity; also one 80 horse-power return tubular boiler, two cylinder boilers, and one large marine boiler, besides several thousands of dollars of orders for fertilizer machinery.

Smith, Myers & Schnier, Cincinnati, Ohio, manufacturers of steam engines, boilers and saw mill machinery, have incorporated under the name of the Smith, Myers & Schnier Company.

The Port Huron Mfg. Company, Port Huron, Mich., manufacturers of power corn machinery, portable sawing, steam power machinery, &c., have commenced the manufacture of gasoline engines, under patents of J. L. Sevisen, control of which the company have secured. Mr. Sevisen is to superintend the construction.

The Ash & Harper Company, Lansing, Mich., manufacturers of gas and gasoline engines, will be reorganized with a capital of $50,000. The company are looking around for a site upon which to erect a new plant to cost about $3500, which will be equipped with up to date machinery. The company are compelled to increase their facilities to keep up with their orders, which they have been unable to do since the commencement of their business.

Buildings and Bridges.

A new court house to cost $1,000,000 is to be erected at Greensburg, Pa. It will be of steel frame skeleton construction, and the material will be furnished by the Carnegie Steel Company of Pittsburgh.

The Albany Architectural Iron Works & Foundry, Albany, N. Y., have been awarded the contract for the structural steel and ornamental iron work for the new office building which is to be erected by the General Electric Company at Schenectady. The contract amounts to between $30,000 and $40,000.

The Chicago Bridge & Iron Company, 105th and Throop streets, Chicago, have secured a large tonnage of sundry railroad bridge work.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, have started work on a big addition to their already extensive plant. The improvements include a brick structure, 300 x 200 feet, to be erected on the 17-acre tract belonging to the company at Hazelton. The new department is expected to be in operation in a few months, and when completed will make the plant one of the most complete of its kind in the country.

The Brown Hoisting Machine Company of Cleveland have taken out a building permit for the erection of the new plant to take the place of the one destroyed by fire some months ago. The building will be a steel structure 312 x 500 feet. The entire works with the exception of the power house and office will be under one roof, which will range in hight from 40 to 60 feet. The cost is estimated at $375,000.

L. Schreiber & Sons Company, Cincinnati, Ohio, structural and ornamental iron works, have purchased a large tract of land at Norwood for the purpose of putting up a manufacturing plant, the building of which is, however, not contemplated for probably some time to come.

The Lombard Iron Works & Supply Company, builders of and dealers in engines, boilers, machinery, supplies, &c., at Augusta, Ga., have awarded a contract to the American Bridge Company, at Baltimore, for an addition, 110 x 220 feet, to the boiler shops. The new building will be equipped with all latest appliances, including a traveling crane, 46-foot span, which has not as yet been closed for.

The George V. Cresson Company, Philadelphia, Pa., power transmitting machinery, are building an addition to their shops for the purpose of increasing their facilities for handling and shipping material, and are contemplating further improvements.

Foundries.

The Lennox Machinery Company, Marshalltown, Iowa, have purchased additional land adjoining their plant and have begun the erection of a brick building, 64 x 120 feet, to be used as a foundry. The company already have a molding shop, and the addition will double their capacity for the manufacture of castings.

The Chicago offices of the Maywood Foundry & Machine Company, Maywood, Ill., have been removed from 507 Monadnock Building, to 517 Chamber of Commerce Building, La Salle and Washington streets.

The Waterbury-Farrel Foundry & Machine Company, Waterbury, Conn., have begun the erection of new buildings, which will include power house, blacksmith shop, &c., plans for which have not as yet been fully prepared.

Hardware.

The property of the Rockford Tack Company, Rockford, Ill., was recently bought by Alfred B. Church of Elgin, Ill. The factory will continue in operation under the new management. J. S. Joslyn is superintendent.

Charles Mallphant, proprietor of the Indiana Edge Tool Works, Gas City, Ind., contemplates the erection of an additional factory for the manufacture of axes. A committee has

been appointed by the mayor to solicit subscriptions to assist in securing the addition to the city's industries.

Weisenborn Mfg. Company, Quincy, Ill., and Indianapolis, Ind., have incorporated for the purpose of increasing their capacity and manufacturing woven wire fence as well as fence machines. They will also make such articles as feed grinders, wood and metal patterns, &c. An addition is being built to their plant in Indianapolis.

The Barnes Mfg. Company, Mansfield, Ohio, manufacturers of iron hand, wind mill and power pumps, report an exceptionally good demand for their productions at this time from all sections of this as well as foreign countries. The company have now in press a new catalogue, a copy of which they will be pleased to mail to those interested.

Finished Rivet Company of Bedford, Ohio, will shortly be incorporated with a capital of $250,000. The company will be composed mostly of Cleveland capitalists. Mr. Schneider of the Schneider-Trenkamp Company of that city is one of the interested parties and will probably be the president of the new concern. Work will soon be commenced on the plant, which will be fitted up with the most approved equipment, including conveyors, cranes, &c. Rivets from ½ to 1¼ inch will be manufactured.

Jackson Knife & Shear Company, Fremont, Ohio, advise us that they find it difficult to fill orders promptly, owing to the great rush of business, which is referred to as fully four times as great as it was last year at this period. They are looking forward to a very large fall trade, and are increasing their facilities with a view to taking care of it with promptness.

The Post Office Department have awarded the contract for furnishing street letter boxes of steel to the Government during the four years beginning July 1 next to the Michigan Steel Box Company, Adrian, Mich. Four sizes of boxes will be furnished, the prices being $2.90, $3.75, $4.25 and $6.25. The last is a new style of box to be put into use.

M. Seward & Son Company, New Haven, Conn., are erecting entirely new factories on Grant street of that city, and on their completion expect to be in much better shape to do business than heretofore. Some changes have been made in the stockholders of the company, but the management will continue the same.

David Round & Son, Cleveland, Ohio, manufacturers of chains, &c., report that they have been favored with an exceptional run of trade during the last four months, surpassing that of the corresponding months of last year. Orders are holding out wonderfully, they state, for this period of the year, and they feel confident that the business of the coming three or four months will parallel, if not outstrip, that of the same months of 1900. The general tone of business in their particular line is referred to as of a good, healthy character.

Cedar Rapids Pump Company, Cedar Rapids, Iowa, are building a factory at Cincinnati, Ohio, for the manufacture of wood pumps and wind mill tanks for the Eastern trade and expect to supply their factory at Cedar Rapids with poplar pump material. They expect to have the Cincinnati plant in operation about the middle of June.

The Michigan Hardware Mfg. Company have been incorporated at Grand Rapids, Mich., with a capital stock of $15,000. They will consolidate the business of the Grand Rapids Specialty Company, the Michigan Hardware Company and L. H. Solosth & Son. Officers of the company are as follows: President, L. H. Solosth; vice-president, Frank H. Matheson; secretary and treasurer, Andrew Allgier. The plant at No. 423-429 Straight street will be occupied by the new company.

Miscellaneous.

In the United States Circuit Court at Pittsburgh suit has been entered by the Evansville Contract Company against the Fort Pitt Gas Company for $70,000 damages for the loss of the steamboat "Indiana." It is charged that the boat was destroyed by an explosion of defendant's gas line in the Ohio River at Legionville.

The American Bicycle Company, at Westfield, Mass., have awarded the contract for an addition to the Loxier plant in that town. The building will be of brick, 300 x 51 feet, three stories, with sub-basement, and of heavy mill construction.

The Hitchman Coal & Coke Company have been chartered at Charleston, W. Va., with a capital of $300,000. The principal offices will be in Wheeling, W. Va.

The Walworth Mfg. Company, steam supplies, &c., are building a four-story brick machine shop, 200 x 80 feet, at their works in South Boston, Mass.

The Ironsides Company of Columbus, Ohio, have just closed their fiscal year, and report business as showing a gratifying increase, and they anticipate a further increase of 100 per cent. the coming year, owing to improvements and extensions of their factory. Their business is the manufacture and supply of special lubricants for the preservation and protection of metallic surfaces, wire ropes, gearing, belting, fiber ropes, &c. Their market includes the largest rolling mills, general manufactories, mining and other industrial institutions.

The Sterlon Copper, Brass & Bronze Company, 61 and 63 North Ashland avenue, Chicago, are extending their plant to the building adjoining their present location, and will utilize the additional space for the manufacture of electric railway specialties. The addition will be equipped with drills, lathes and the latest appliances for the manufacture of their lines, and it will give them twice the amount of space they had previously. The building was formerly occupied by the Hall Steel Tank Company, who have removed to 193 South Desplaines street.

The electrical elevator factory of Weiler & Barth, Milwaukee, Wis., was recently burned with an estimated loss of about $30,000, covered by insurance. The firm will open up new quarters as quickly as possible, and resume operations. The fire occurred during a very busy season for the firm, catching them with a large number of orders on hand.

The Georgia Supply Company, Savannah, Ga., commenced business March 1 for the handling of mill, railroad and steamboat supplies. The officers are: President, E. F. Hartfelder; vice-president and general manager, George V. Denny, and secretary and treasurer, J. K. Haslam.

A Tour of Inspection.—PITTSBURG, May 15, 1901.—(*By Telegraph.*)—A party of officials of the United States Steel Corporation, including C. M. Schwab, president; E. H. Gary, Henry Wick, A. F. Luke, Richard Trimble, and W. E. Corey, were in Pittsburgh yesterday on their way to the Mahoning and Shenango valleys to inspect the plants owned by the United States Steel Corporation in those districts. While in Sharon the party visited the new works of the Sharon Steel Company, which has given rise to the report that they are to be taken over by the United States Steel Corporation. We may note that C. M. Schwab stated some time since that no more plants would be taken over this year by the United States Steel Corporation, and therefore the report that the Sharon Steel Company would be acquired is probably untrue. Mr. Schwab visited this plant at the invitation of John Stevenson, Jr., who was formerly connected with the Carnegie Steel Company at the Edgar Thomson Steel Works. From the Mahoning and Shenango valleys the party went to the Wheeling district, and from there will go to Columbus. No special significance is attached to this trip by the United States Steel Corporation officials, but it is merely an inspection trip, to allow Mr. Schwab and the other officials to become more familiar with the properties under their control. Some of these plants Mr. Schwab has never seen.

The American Sheet Steel Company.—The following have been elected directors of the American Sheet Steel Company: Geo. G. McMurtry, John A. Topping, Wallace P. Bache, C. M. Schwab, E. H. Gary, D. G. Reid, W. B. Leeds, F. S. Wheeler, W. T. Graham, T. M. Day, Jr., J. Warner. The officers remain the same.

The Garrett-Cromwell Engineering Company of Cleveland have been forced to enlarge their quarters to take care of increasing business. The company have recently arranged to occupy nearly one-half of the eleventh floor of the New England Building, and the force of engineers is to be added to. Mr. Cromwell of the company is now in Denver looking after the construction of the new plant of the Colorado Fuel & Iron Company of Denver, which his company are erecting.

The Bullock-Wagner Sales Organization has established a district office at 1624 Marquette Building, Chicago. It will be in charge of H. B. Foster, who has for about two years served the Wagner Company as sales agent. He will have the able assistance of E. W. Goldschmidt, formerly of the Western Electric Company, in covering this most important field.

The Brier Hill Iron & Coal Company, operating Brier Hill Furnace, at Youngstown, Ohio, have bought 1000 acres of coal lands in the new Klondike coke fields. The concern do not expect at present to erect ovens.

The Dominion Iron & Steel Company of Sydney are placing the machinery contracts for the new steel rail mill. A report is current that additional blast furnaces are to be erected.

The Iron and Metal Trades.

Taken as a whole the Iron markets have quieted down considerably and it seems likely that some time may elapse before buyers and sellers get together on the question of the basis for the second half of the year. In some sections and in some branches sellers show some uneasiness, which points to concessions in order to start the buying movement for the third and fourth quarters. The effect of the flurry in stocks has probably not been measured yet. It will cut off many wildcat enterprises, which is an advantage rather than a drawback. On the other hand, some buyers show a disposition to hold off in order to watch developments.

It is a significant fact that the Agricultural Implement makers continue in the market for supplies for the future, notably Charcoal Pig Iron and Steel Bars, thus showing that the one industry which is nearest to the farming interests enjoys unshaken confidence.

Some uneasiness is created by the danger of widespread labor disturbances. The situation created by the demands of the machinists may develop awkward phases, and there is a feeling that in the territory partially controlled by the Amalgamated Association of Iron and Steel Workers there may possibly be trouble after July 1. Labor, generally, is reported to be scarce, and seems inclined to be aggressive.

Some good contracts have been placed for Welded Pipe, and quite considerable quantities of Structural Material have been placed.

It is noteworthy that prices abroad for bridge work have declined so much lately that American companies are practically withdrawing from the competition. This we understand to be the case with the Clyde contract, which involves about 9000 tons, and with the Copenhagen and Amsterdam draw bridges, both large structures.

The Steel Rail trade has quieted down, as was expected. We understand that the arrangements for the next fiscal year have been under consideration, in connection with which the announcement is significant that Jones & Laughlins, Limited, are to build a mill for rolling Rails. The Dominion Company, at Sydney, are also reported to be placing orders for Rail mill machinery.

How rapidly conditions have changed is illustrated by the fact that foreign Old Steel Rails and Old Iron Rails are now being offered for importation. It was not so long since that the export trade in this branch was flourishing. It should be noted, however, that the foreign prices are still so much above our market as to put business out of the question.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	May 15, 1901.	May 8, 1901.	Apr. 17, 1901.	May 17 1900.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	*$15.25*	$15.25	$15.50	$20.50
Foundry Pig, No. 2, Southern, Cincinnati	*13.75*	14.00	14.50	19.75
Foundry Pig, No. 2, Local, Chicago	15.50	15.50	15.50	22.50
Bessemer Pig, Pittsburgh	*16.25*	16.25	16.75	nom.
Gray Forge, Pittsburgh	14.75	14.75	14.75	19.25
Lake Superior Charcoal, Chicago	18.00	18.00	18.00	24.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh (nom.)	24.00	24.00	24.00	29.00
Steel Billets, Philadelphia (nom.)	*26.20*	26.25	27.00	31.50
Steel Billets, Chicago (nom.)	.....	28.00	.....	nom.
Wire Rods (delivered)	**39.00**	39.00	38.00	48.00
Steel Rails, Heavy, Eastern Mill	**28.00**	28.00	26.00	35.00
Spikes, Tidewater	**1.80**	1.80	1.60	**2.40**
Splice Bars, Tidewater	1.40	1.40	1.40	**2.20**
OLD MATERIAL:				
O. Steel Rails, Chicago, gross ton	*13.50*	13.50	14.50	17.50
O. Steel Rails, Philadelphia	*16.75*	16.75	17.00	20.00
O. Iron Rails, Chicago, gross ton	*19.00*	19.00	20.50	19.50
O. Iron Rails, Philadelphia	19.50	19.50	19.50	22.00
O. Car Wheels, Chicago, gross ton	16.50	16.50	16.50	24.00
O. Car Wheels, Philadelphia	**17.50**	17.50	16.50	22.00
Heavy Steel Scrap, Chicago, gr. ton	*13.50*	13.50	14.00	14.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.50	1.50	1.50	1.75
Common Iron Bars, Chicago	*1.55*	1.55	1.60	2.05
Common Iron Bars, Youngstown	*1.55*	1.45	1.50	1.90
Steel Bars, Tidewater	1.62½	1.62½	1.62½	2.00
Steel Bars, Pittsburgh	*1.55*	1.45	1.50	1.95
Tank Plates, Tidewater	1.80	1.80	1.80	1.75
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.70
Beams, Tidewater	1.75	1.75	1.75	2.40
Beams, Pittsburgh	1.60	1.60	1.60	2.25
Angles, Tidewater	1.75	1.75	1.75	2.40
Angles, Pittsburgh	1.60	1.60	1.60	2.25
Skelp, Grooved Iron, Pittsburgh	*1.75*	1.75	1.85	1.70
Skelp, Sheared Iron, Pittsburgh	1.85	1.85	1.85	1.75
Sheets, No. 27, Pittsburgh	*3.20*	3.20	3.25	3.15
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh	2.30	2.30	2.30	2.30
Cut Nails, Mill	2.00	2.00	2.00	2.05
METALS:				
Copper, New York	17.00	17.00	17.00	16.87½
Spelter, St. Louis	.....	3.85	3.80	4.40
Lead, New York	4.37½	4.37½	4.37½	4.00
Lead, St. Louis	.....	4.20	4.22½	3.95
Tin, New York	*26.10*	26.30	26.25	28.50
Antimony, Hallett, New York	8.75	8.75	8.75	9.75
Nickel, New York	**60.00**	55.00	55.00	50.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.84

Chicago. (*By Telegraph.*)

Office of *The Iron Age*, 1205 Fisher Building, Chicago, May 15, 1901.

The flurry in the stock market naturally absorbed considerable attention last week, but it had much less effect on the Iron trade than might have been expected. The fact that the great fall in prices of stocks caused very few failures was reassuring. Demonstration was thus made of the strong financial condition of the country. Such a shock being borne without the collapse of important banking and brokerage houses shows the strength of financial interests. Contracts of various kinds which had been pending during the week were signed on the day following the Wall street panic. This is regarded as a very healthy sign. An error was made last week in the statement that buying by implement manufacturers was about over. Although it is believed that nearly all the largest implement makers have placed their season contracts, a considerable number of important establishments came in the market the past few days and others are negotiating.

Pig Iron.—The week has been rather quiet, but the outlook now indicates some activity. Good inquiries are in the market for Foundry Iron, and it is believed that considerable buying will be done very shortly. Agricultural implement makers and car wheel interests are

also asking prices on large lots of Charcoal Pig Iron, some asking for 5000 tons and others as high as 10,000 tons. Prices generally are unchanged, but Southern Foundry Iron may be shaded perhaps 50c. per ton. Furnace companies, however, are not giving their agents much discretion and the low prices may be suddenly withdrawn. Sales of local Foundry Iron have been made in fair quantities at full prices. We quote as follows, Chicago delivery:

Lake Superior Charcoal	$18.00 to $18.50
Local Coke Foundry, No. 1	16.00 to 16.50
Local Coke Foundry, No. 2	15.50 to 16.00
Local Coke Foundry, No. 3	15.00 to 15.50
Local Scotch, No. 1	16.25 to 16.50
Ohio Strong Softeners, No. 1	16.50 to 16.75
Southern Silvery, according to Silicon	16.15 to 16.60
Southern Coke, No. 1	15.90 to 16.15
Southern Coke, No. 2	15.40 to 15.90
Southern Coke, No. 3	14.90 to 15.40
Southern Coke, No. 1 Soft	15.90 to 16.40
Southern Coke, No. 2 Soft	15.40 to 15.90
Foundry Forge	14.40 to 14.65
Gray Forge and Mottled	13.90 to 14.15
Southern Charcoal Softeners, according to Silicon	15.50 to 17.00
Tennessee Silicon Pig	16.50 to 17.50
Alabama and Georgia Car Wheel	20.65 to 21.00
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	18.00 to 18.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon	17.00 to 18.00

Bars.—A great deal of contract business is being closed, the tonnage of the past week having been considerably above the average of weekly transactions. Inquiries are still coming forward and much more business is likely to be done this week. Quite an urgent demand is felt for prompt shipment of small lots, for which mills have obtained as high as 1.70c., Chicago, for Common Iron. Usual quotations of mill shipments are 1.55c. to 1.60c., Chicago, for Common Iron, 1.60c. to 1.65c. for Soft Steel Bars, and 2c., base, for Hoops. These prices may perhaps be shaded a trifle for Iron, especially for ordinary sizes, but Steel prices are very firm. Jobbers are still having much trouble in securing satisfactory shipments from the mills to keep up their full stock assortments. The demand from stock is continuously heavy. Small lots are quoted by jobbers at 1.90c. to 2c. for either Iron or Steel Bars, and 2c. to 2.25c., base, for Hoops.

Structural Material.—A good tonnage is daily being booked in small lots. Large contracts are few at present, although some figuring is being done on bridge and building work involving good quantities. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—Here and there a mill can be found promising better deliveries, but the majority of the mills are loaded with work, taking their full capacity for several months. The demand for mill shipments is not so large as it has been, but a heavy movement is reported from stocks in local warehouses. This is the season when a great deal of repair work is being done and consumers are in need of prompt deliveries of material. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—While manufacturers are still greatly in arrears on deliveries they are steadily in receipt of good business from large buyers, who are placing orders even if they are obliged to wait a considerable time for shipment. Their experience this spring has been such as to cause them to anticipate their necessities for several weeks if not months. A heavy trade from store is still a feature of the local Sheet trade, the demand being large for both the Black and Galvanized Sheets, but more particularly Galvanized. Orders are being received now by jobbers for Coke Tin Plates for fall delivery in anticipation of the requirements of the furnace trade. The Tin Plate mills are making somewhat better deliveries, but are still far from having caught up with their orders. Small lots of No. 27 Black Sheets from stock are quoted at 3.40c. to 3.50c., and Galvanized, 70 off.

Merchant Pipe.—Conditions continue very satisfactory from the standpoint of the mills. The demand is very good. Manufacturers' prices, random lengths, are as follows:

	In carloads.		Less than carloads.	
	Blk.	Galvd.	Blk.	Galvd.
⅛ to ½ inch and 11 to 12 inches	59.2	46.2	54.9	40.9
¾ to 10 inches	66.7	53.3	61.9	49.9

Boiler Tubes.—Orders for mill shipment are reasonably numerous, but the demand from jobbers' stocks is moderate. Prices are firm. Quotations on less than carload lots from jobbers' stocks are as follows:

	Steel.	Iron.
1 to 2½ inches	50	40
2¾ to 5 inches	57½	47½
6 inches and longer	50 and 5	47½

Rails and Track Supplies.—Many more Rail contracts could be secured if the manufacturers were able to promise summer delivery. The mills, however, are crowded with work far into the fall months. Light Rails are in good demand, with the steady booking of considerable tonnage for forward delivery. Quotations range from $28 to $33, according to section. Track Fastenings are in active demand, with few manufacturers in position to promise even reasonable delivery. Quotations are as follows: Splice Bars, 1.75c. to 1.80c.; Spikes, 1.95c. to 2c.; Track Bolts, with Hexagon Nuts, 2.80c., with Square Nuts, 2.65c.

Billets.—Steel Billets continue very scarce. The local demand is for small lots running from carloads to 100 tons, but it is almost impossible to secure anything but Open Hearth Billets. Manufacturers quote Open Hearth Billets $32.80, Chicago. It is stated that Bessemer Billets could easily be sold at $38 if the manufacturers were able to furnish any.

Merchant Steel.—More implement contracts are reported, several good transactions of this kind having been closed since last report. The demand for ordinary quantities from the regular trade is excellent. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. for carloads and 7c. from store; Specials, 13c. upward.

Old Material.—Consumers generally are holding off, and meanwhile the supply continues to become more plentiful. Buying is confined to small quantities of only such classes of material as may be needed atonce. Prices are unchanged from the reduction made last week. The following are approximate quotations per gross ton:

Old Iron Rails	$19.00 to $20.00
Old Steel Rails, mixed lengths	13.50 to 14.00
Old Steel Rails, long lengths	16.00 to 17.00
Heavy Relaying Rails	21.00 to 22.00
Old Car Wheels	16.50 to 17.00
Heavy Melting Steel Scrap	13.50 to 14.00
Mixed Steel	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates	$17.00 to $17.50
Iron Car Axles	20.00 to 20.50
Steel Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	15.50 to 16.00
No. 2 Railroad Wrought	13.00 to 13.50
Shafting	15.50 to 16.00
No. 1 Dealers' Forge	12.50 to 13.00
No. 1 Busheling and Wrought Pipe	11.00 to 11.50
Iron Axle Turnings	10.00 to 10.50
Soft Steel Axle Turnings	9.50 to 10.00
Machine Shop Turnings	9.00 to 9.50
Cast Borings	4.00 to 4.50
Mixed Borings, &c	4.50 to 5.00
No. 1 Boilers, cut	12.00 to 12.50
No. 2 Boilers, cut	10.00 to 10.50
Heavy Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	8.50 to 9.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 11.50

Metals.—Lake Superior Copper is steadily held at 17½c. for Lake and 17¼c. for Casting brands. Pig Lead is in fair demand, but quotations show no change from 4.32½c. for Desilverized and 4.42½c. for Corroding in 50-ton lots.

Coke.—The contract price for 72-hour Connellsville Coke continues at $4.75 to $5, but the local market is suffering from receipts of Coke on track, which must be sold to save demurrage. Transactions under these circumstances are running at about $4.50.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, May 15, 1901.

(By Telegraph.)

Pig Iron.—The Bessemer Pig Iron market is practically lifeless and prices seem easier. The views of the United States Steel Corporation as to prices of Iron for second half are about $15, at furnace, but so far nothing has been done. A good deal of Basic Iron has been sold at $15 at furnace, while higher prices are reported to have been paid for prompt Iron. Forge Iron for May and June shipment is very strong at $14, at furnace, but for second half could likely be bought at lower prices. Foundry Iron is firm and in fair demand. We quote Bessemer Iron $15.75 to $16, at furnace, in small lots, or $16.50 to $16.75, Pittsburgh. On round lots of Bessemer Iron for extended shipment these prices would likely be shaded. Forge Iron is $14, at Valley, and $14.75, Pittsburgh; No. 2 Foundry, $15 to $15.75, Pittsburgh. We note a sale of 500 tons of Standard Forge for May and June at $14, at Valley furnace.

Steel.—Billets continue very scarce, and Steel from other sections is being brought into Pittsburgh. We quote Billets at $24, Pittsburgh, Valley or Wheeling, but note that Steel is being shipped from Youngstown into the Pittsburgh district. Sheet Bars are $1 a ton above the price of Standard 4 x 4 Billets. The supply of Sheet Bars is much larger, and Sheet mills have no trouble now in getting Bars as fast as wanted.

A slight break has occurred at the Bessemer plant of the Republic Iron & Steel Company at Youngstown, Ohio, and it will be idle for some days.

(By Mail.)

The testimony of C. M. Schwab, president of the United States Steel Corporation, before the Industrial Commission on Saturday, May 11, has excited a good deal of interest in the trade here, and Mr. Schwab's statements have been very widely discussed. He is regarded as a very able man, but many in the trade disagree with Mr. Schwab in some of his statements. While it is probable that the visible Ore supply may be used up in 50 or 60 years, as Mr. Schwab says, yet new Ore fields are certain to be developed before half a century rolls around, and the same is true of new Coke fields, Mr. Schwab contending that the visible supply of Connellsville Coking Coal will be exhausted at the present rate of mining in 30 years. The Iron trade is in about the same condition as noted in this report last week. There is a good demand for all kinds of Finished Iron and Steel, and prices are strong. Prices on Structural Material, Plates, Steel Bars and Steel Rails and Billets are fixed by agreement, and so far as we are advised, are being strictly held. There is no pressure on the part of the mills to sell, but most of the leading works are sold up for from 60 to 90 days, and are having a good demand for stuff right along. The possibility that there may be some friction between the Amalgamated Association and the United States Steel Corporation when the time comes to fix up the wage scale may accelerate demand to some extent between now and July 1. If the views of Mr. Schwab toward labor organizations are carried out by the presidents of the constituent companies of the United States Steel Corporation, there will certainly be labor troubles. However, these matters are likely to be left largely to the presidents of the various companies for settlement as they see fit.

Ferromanganese.—We continue to quote 80 per cent. Ferromanganese at $58.50 in carload lots, delivered at buyer's mill. Some foreign Ferro is being sold in this market.

Structural Material.—The big buildings that will be put up this year are all in, and specifications on the material for these are now being received by the Structural mills. There is a scarcity of Shapes for prompt shipment, the mills being filled up for the next two or three months. While it is a little early yet to make forecast, it is thought that the tonnage this year in Structural Material, including Beams and Channels, Angles, Zees and Tees, aside from Plates, will exceed 600,000 tons. A good many small lots of material are being placed, and all the bridge companies are full of work. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.40c. to 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Plates.—We note an unusually large demand for Universal Plates, and the mills are filled up for the next two or three months. There is also quite a heavy demand for Fire Box Steel, the locomotive shops all being full of work and liberal buyers of Plates. We quote: Tank quality, ¼-inch and heavier, 1.60c.; 3-16 inch, 1.65c.; under 3-16 inch and above No. 10, 1.70c.; Flange or Boiler Steel, 0.1c. advance over the base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

Steel Rails.—The market is quiet, most of the tonnage for this year having been placed some time since. Two or three of the leading mills are practically out of the market as sellers of Rails for balance of this year. The two Rail mills owned by United States Steel Corporation, Edgar Thomson Works and the Federal Steel Company, ought to make close to 1,200,000 tons this year. No more Rails will be rolled at the Ohio Works, at Youngstown, the equipment being moved to Chicago. We quote Standard Sections at $28, at mill.

Bars.—We note a continued good demand for Steel Bars, the Implement makers placing orders earlier this year than usual. The car builders are placing heavy orders and for extended delivery. There is some difficulty in getting prompt deliveries of Steel Bars, owing to the scarcity of Billets. One leading interest rolling Steel Bars report they are sold up for balance of this year. We quote Steel Bars at 1.40c. in very large lots to implement makers and other heavy consumers, this price being absolute minimum of the market. For ordinary tonnage the mills quote 1.45c. to 1.50c., full half extras, at mill. Open Hearth Steel Bars carry $2 a ton advance and high carbon Bars also carry extras. All prices on Steel Bars are f.o.b. Pittsburgh, plus freight. We quote Common Iron Bars at 1.45c. to 1.50c., half extras, Valley mill.

Sheets.—We note a continued heavy demand for Sheets, and some of the leading mills are out of the market as sellers for the next three or four months. Jobbers are having a very active demand and are able to sell carload lots that ordinarily would go to mills. A good deal of tonnage in Sheets has been booked for second half of the year. We quote No. 27 Black Sheets, box annealed, 3.20c. to 3.25c.; No. 28, 3.30c. to 3.35c.; No. 24 gauge for prompt delivery have sold at 3.25c. and higher. We quote Galvanized Sheets at 70 and 5 per cent. off in carload lots, maker's mill.

Skelp.—Prompt delivery of Skelp is hard to get, and high prices are being paid. We quote Grooved Iron and Steel Skelp at 1.75c. to 1.80c., and Sheared at 1.80c. to 1.85c., maker's mill. Prices are about $1 a ton higher, delivered f.o.b. Pittsburgh.

Tubular Goods.—The further development of the Oil fields in Southern Texas is causing a continued heavy demand for oil well supplies, and almost every day many carloads of material of this kind are shipped to Texas by Tube mills in the Pittsburgh district. In the past two months or so several hundred carloads of material have gone to Texas from this district. We also note that some large gas lines have recently been placed, and tonnage of this kind has probably been larger this year than ever before. Contracts taken by National Tube Company for water lines for California are noted elsewhere in this issue. There is a continued good demand for Tubular Goods of all kinds, and prices are very firm. Stocks in jobbers' hands are light and prices are being very well maintained, there being an almost entire absence of cutting. To the small trade prices are as follows:

Merchant Pipe.

	Per cent. Black.	Per cent. Galvd.
⅛ to ½ inch and 11 to 12 inch	61	48
¾ to 10 inch	68½	56

Casing, Random Lengths.

	S. & S.	I. J.
2 to 3 inch	58	53½
3½ to 4 inch	63	59
4½ to 12½ inch	65	61½

Casing, Cut Lengths.

	S. & S.	I. J.
2 to 3 inch	53½	59
3½ to 4 inch	59	55
4½ to 12½ inch	61½	57½

Boiler Tubes.

	Up to 22 feet. Per cent.
Steel.	
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive	65½
2 inch to 2½ inch, inclusive	60
6 inch and larger	59
Iron.	
1 inch to 1½ inch and 2½ inch	43½
1¾ to 2¼ inch	43
2¾ to 13 inch	53

Prices made by the mills to the jobbers are from 5 to 7½ per cent. less than the above.

Coke.—Output of Coke in the Connellsville region last week was 234,637 tons, a slight decrease over the previous week; 19,819 ovens were active and 1628 idle. It is hard to find a market for either Furnace or Foundry Coke, all the consumers being covered by contracts. Some surplus Coke for May shipment is being offered at comparatively low prices. We quote strictly Connellsville Furnace Coke at $2, and Foundry at $2.50. Main Line Furnace Coke is $1.65 to $1.75 and Foundry $2.15 to $2.25 a ton. For prompt shipment it is probable our lower price on Furnace Coke would be shaded.

Philadelphia.

Office of *The Iron Age*, Forrest Building,
PHILADELPHIA, PA., May 14, 1901.

There is no relief from the dullness of the past several weeks, which has, in fact, become somewhat intensified during the past few days, and to give any clear or distinct idea of the situation it is impossible to avoid a reiteration of what has been said several times recently. There is plenty of business to go on with, everything is running up to full capacity, and in that respect there is no possible ground for complaint. The discouraging feature is in the absence of demand for deliveries during the last half of the year, as very few orders have been placed and very few have been offered; consequently sellers are becoming restless, as they are anxious for business and are prepared to meet buyers on liberal terms. Whether the delay is due to temporary causes or to a probable shrinkage in consumption after midsummer is difficult to determine. The attitude of labor is not conducive to confidence, as an extended suspension of work at a time when the production of Pig Iron is the largest on record would soon lead to accumulations, which would have a depressing effect and might lead to a general disorganization, from which it would be difficult to recover. The feeling is undoubtedly less confident than it was, although there is much to be said in favor of a belief in continued activity. Recent events in the stock market have become powerful object lessons, however, and while the decline in stocks has no bearing whatever on trade conditions it carries with it suggestions of possible setbacks, which, to say the least, tends to conservatism and increased caution. Prices in nearly all cases are about the same as they were a week ago, but the feeling is somewhat easy, for reasons which we have already mentioned.

Pig Iron.—Apathy on the part of buyers has been the most prominent feature since date of our last report. The demand for several weeks past has been on a gradually declining scale, and although the statistics published in last week's issue of *The Iron Age* show a surprisingly good condition as regards stocks, it has been utterly unavailing so far as it affects prices. Unless Iron is needed for this or next month's delivery there is very little demand, and although prices would no doubt be adjusted to buyers' ideas, they are totally unresponsive. Makers of Iron are becoming quite anxious to secure some business for the last half of the year, but the indifference of buyers has had a depressing influence, which appears as though it might continue unless some unexpectedly favorable developments are met with. Inquiries do not encourage the idea of any material change in the situation, however, and the trade are gradually settling down to the belief that this and the coming month will meet with a dull and sagging market. There has been some inquiry for both Basic and Bessemer Pig, but there is nothing in it to warrant the hope that any large amount of business will be done. It is true that the available supply for immediate delivery is limited, but whatever business of consequence may be done during the next month or so will have reference to deliveries during the later months of the year. Prices for city and nearby points are about as follows: No. 1 X Foundry, $16 to $16.25; No. 2 X Foundry, $15.25 to $15.50; No. 2 Plain, $14.75 to $15; Standard Gray Forge, $14.25 to $14.50; Ordinary Gray Forge, $14; Basic (Chilled), $14.25 to $14.50.

Billets.—Business is extremely dull, and, although quotations are nominal at $26.20 for Ordinary Steel, there appears to be no disposition to offer Steel at less money for the sake of getting deliveries. Special Steels are in fair demand at the usual advances, according to carbon requirements.

Plates.—New business is not particularly plenty at the present time; there is a good ordinary demand, but not quite enough to keep pace with the mill shipments. Orders which are already in hand, however, are expected to tide them over the midsummer dullness, and by that time it is hoped that there will be a fresh inflow of new business. Prices are a shade easier, although not quotably lower, but it is evident that favorable terms could be had for immediate contracts which would carry with them satisfactory dates for deliveries. General quotations for city or nearby points are about as follows: Plates, ¼ inch and thicker, 1.80c. to 1.85c.; Universals, 1.80c. to 1.85c.; Flange, 1.90c. to 2.10c.

Structural Material.—The situation is very closely akin to that in the Plate trade, as shipyards and other large consumers require certain proportions in each line of goods, so that when the Plate trade is active the Structural mills are active in proportion. The facilities for producing shaped material may be somewhat less relatively, and for that reason deliveries are in some cases pretty hard to secure with the promptness which could be desired. Prices remain as last quoted for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—There is still quite a good run of orders for Bars, and in the majority of cases mills are running to their full capacity, with nothing in sight to indicate less favorable conditions in the near future. Prices unchanged, 1.50c. to 1.55c. being the usual quotation for Iron Bars and 1.62½c. to 1.70c., delivered, for Steel Bars.

Sheets.—There can be no change in the report of the Sheet trade, as the mills are loaded up with orders and are, therefore, under no necessity for seeking business or making any change in their prices, which are as follows for best Sheets (common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c.; No. 28, 3.75c. to 3.80c.

Old Material.—There is a somewhat better demand, but at lower prices, except for special stock. Steel Rails in short pieces have been sold at $17.50, but $17 is usually regarded as a pretty full price. Low Phosphorus Steel under 0.05 was sold at $20.50, but 0.03 would command at least $1 more. Choice Railroad has been sold at $19 to $19.50, and Ordinary Country Scrap at $15.50 to $16, although $17 is paid for extra qualities. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, $19 to $20; Country Scrap, $16 to $17; No. 2 Light Scrap, $12.50 to $13.25; Machinery Cast, $14 to $14.50; Heavy Steel Scrap, $16.75 to $17; Old Iron Rails, $19.50 to $20; Old Steel Rails, $16.75 to $17; Wrought Turnings, $12 to $12.50; Cast Borings, $8.75 to $9; Old Car Wheels, $17.50 to $18; Iron Axles, $21.50 to $22.50; Steel Axles, $17 to 18.

Cincinnati. (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets, Cincinnati, May 15, 1901.

The situation in Pig Iron is not materially changed from what it was a week ago. Trading has been rather light and the outlook for the nearby future is quiet. Buyers are not evidencing very much interest and there is a little uncertainty covering the market. Prices are certainly not steady and the first step has been taken in a decline. A sale in an interior Ohio city made a few days ago was on the basis of $11, Birmingham, for No. 2 Soft, and on this basis a number of furnaces have authorized offerings. Freight rate from Birmingham is $2.75 to this point; from Hanging Rock district, $1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$14.25 to $15.00
Southern Coke, No. 2	13.75 to 14.50
Southern Coke, No. 3	13.25 to 14.00
Southern Coke, No. 4	12.50 to 13.25
Southern Coke, No. 1 Soft	14.25 to 15.00
Southern Coke, No. 2 Soft	13.75 to 14.50
Southern Coke, Gray Forge	12.50 to 13.25
Southern Coke, Mottled	12.50 to 13.25
Ohio Silvery, No. 1	16.00 to 16.50
Ohio Silvery, No. 2	15.00 to 15.50
Lake Superior Coke, No. 1	15.50 to 15.75
Lake Superior Coke, No. 2	15.00 to 15.25
Lake Superior Coke, No. 3	14.50 to 14.75
Southern Basic	14.00 to 14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	$18.25 to $18.75
Standard Southern Car Wheel, No. 2	17.25 to 17.75
Lake Superior Car Wheel and Malleable	18.50 to 19.00

Plates and Bars.—The market has been quiet and prices are unchanged. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.60c., with half extras; same in small lots, 1.80c., with full extras; Steel Bars, in carload lots, 1.15c., with half extras; Base Angles, in carload lots, 1.80c.; Plates, ¼-inch and heavier, 1.80c.; Sheets, No. 16, 2.50c.

Old Material.—No change in the general situation. Trade is quiet. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, $16; Cast Railroad Machine Scrap, $12.25 to $12.75; Iron Axles, $18.75 to $19; Iron Rails, $16.75 to $17.25; Steel Rails, rolling mill lengths, $14.75 to $15.25; short lengths, $13.75 to $14; Car Wheels, $15.75 to $16.25. All prices except No. 1 Wrought on the basis of gross tons.

Cleveland.

Cleveland, Ohio, May 14, 1901.

Iron Ore.—The Iron Ore market is now settling upon a new basis, and whether it is to be different from the one recently established remains to be seen. During the week the ice blockade between the upper and the lower lakes has disappeared, and only yesterday the strike of the marine engineers was brought to an end virtually, through the settlement between the strikers and the fleet of the United States Steel Corporation. By these two events the embargo on commerce has effectually been raised and business may now be conducted along natural lines. It only remains, therefore, to determine what effect the month's delay is to have on the freights and what the probable consumption of Ore is to be. The delay most likely will wipe out the natural surplus of tonnage, promising a good rate, and if the shipment is to be anywhere near what it promises now to be the freights ought to be excellent during the year. The amount of Ore to be shipped will depend upon the sales of Pig Iron to the melters, as the increased capacity of the furnaces will permit of the melting of about all of the Ore that can be brought down the lakes during the remainder of the season. In this connection the shippers are making allowance in their estimates of Ore consumption for the 3,000,000 tons which recent reports establish as the amount now on the lower lake docks, this aggregate being figured from the reports of the dock managers at the various Lake Erie ports. This week some more season contracts have been placed with big carriers, so that the aggregate now under contract for movement is approximately 17,000,000 tons. It is believed that there is yet 1,000,000 tons that will be placed with contract tonnage, leaving about 2,000,000 to be brought down by means of wild charters made during the season. Both wild and contract rates are on the same basis, 80c. from Duluth, 70c. from Marquette and 60c. from Escanaba to Ohio ports.

Pig Iron.—The market remains quiet, comparatively. A little business is moving all the time, and a few sales of carload lots or more are made from time to time, but when compared with previous sales are a little light. The capacity of the plants is pretty well sold up, as is well known, for the first half of the year, and the furnacemen do not look for any great activity until after July 1. On what sales are now made the old prices prevail, although the market is not strong. No. 1 Foundry is quoted at $15.25 and $15.50, with No. 2 Foundry standing at $14.75 and $15. Basic is nominally quoted at $16, and Bessemer at $16.50, all Valley furnace. These latter quotations are purely nominal, as sales are decidedly limited. Buyers are holding back on doing business past July 1, believing that the prices will be lowered. They have orders which are to be placed as soon as the prices are settled, for the business of the second half, but so far there is no intimation of what these are to be. It is generally accepted now that a reduction will be made. This is based upon the knowledge that a large amount of capacity is to be added by the blowing in of new furnaces that are now in the process of construction and will be completed in time to participate in the trade during the latter part of the year. Until the extent of this capacity is learned it would be a hard matter for the furnacemen to agree on any fixed set of prices. The increased capacity and the low price of Iron Ore will give the buyers a leverage on the market by which they hope to lower the prices.

Finished Material.—The market has picked up a little during the week. The suspension in buying proved to be but temporary, and orders are now coming in with reassuring regularity. These are small, to be sure, but they aggregate a very satisfactory business. The leader appears to have been Structural Material during the week, as some nice orders have been placed, and others are in prospect, the market having heard through inquiries of quite a good tonnage in prospect. In addition the specification on former orders have been brisk, allowing the mills to keep up a lively clip. All of them are running full blast, and show no signs of abating one whit from their energy. The prices on Structural Shapes remain as they have been at 1.60c. The Pittsburgh Rail trade is not as active as it was. A few small orders have been placed for electric lines at the new price of $28, but they have not been very large. The mills are well filled with orders, however, and some of them are refusing to take others. The shipments on former orders are increasingly heavy, as the building season with railroads is now at its hight. In Plates the mills will have to find a market in the near future, exclusive of the shipbuilding orders. Shipbuilding on the lakes has been more than ordinarily heavy for the last season, and in consequence the orders given to the Steel mills have been large. The boom has about passed, and the shipbuilding companies will soon face the alternative of building stock boats or allowing their yards to lie idle. Other Plate buyers, however, see a good business ahead, especially the bridge builders. The price remains firm at 1.60c., Pittsburgh. Bar orders are coming in steadily, but are not large. The price holds steady at 1.45c., Pittsburgh. Generally the Finished Material market is strong, and while there is talk of lower prices in other grades no reports have made their appearance concerning this product.

Old Iron.—The business this week has been a little light, with no very large sales recorded. The prices are quoted nominally as follows: No. 1 Wrought, $16.50 net; Iron Rails, $20 gross; Steel Rails, $16.50 gross; Car Wheels, $19 gross; Cast Borings, $6 net; Wrought Turnings, $10 net; Machinery Cast, $13 net.

The management of the Pennsylvania Steel Company of Steelton, Pa., is looking into the building of a by-product coke oven plant.

Birmingham.

BIRMINGHAM, ALA., May 14, 1901.

The market is hard to quote accurately. Reports concerning prices vary so as to confuse one as to proper market quotations. There was one sale of 800 tons of No. 2 Foundry at $11.75 and there were sales at less prices. Some of these prices quoted were as low as $11.25, but they are vigorously denied. It is very evident that prices are not uniform, and that while some report a good, steady trade in a small way at satisfactory prices, there are others who have not had such smooth sailing. On a basis of $11.75 for No. 2 Foundry, Gray Forge should be quoted at $10.50. We all know from current rumor it has sold at $10 and less. "Circumstances alter cases," and each interest has its own peculiar situation to consider. There are cases where sales agents have accepted lower prices than were quoted to them and had their orders refused. It may be that some of these uncompleted transactions were the basis for the lower prices quoted. There were some transactions in Basic Iron, and one lot of 1000 tons was taken at $11.50, while an option was given on another lot of 10,000 tons, which had not been accepted at the close of the week. The demand for Steel continues good and sales as to deliveries are lengthening out. Some have been made that extend into 1902. Prices for Steel range around $23. There has been a good trade in Axle Steel; in fact, the regular order trade for the various forms of the output is constantly on the increase, with every prospect of marketing without trouble all the output of the mill. It will soon be running to maximum capacity.

Mention was made some time ago of the conclusion of a deal which transferred certain important Coal properties to the control of Pittsburgh capital. The Virginia & Alabama Coal & Coke Company and the Corona Coal & Coke Company were among the properties absorbed, and all the details necessary to perfect complete ownership have been concluded. The properties absorbed are the ones that threatened the supremacy of Pittsburgh in the Mississippi River trade. The deal secures to the new owners an advantage from which nothing can dislodge them. They will absolutely control that trade. The entire deal is said to have involved $3,000,000.

Some of the other companies are increasing their capitalization and some are arranging for additional capital to develop their properties. It looks as if there was a move toward concentration of capital and economy in management. The demand for Coke continues fine, showing the active condition of the various Iron industries. Some railroad move is on foot in the district, and in circles that ought to be well posted it is said that the Illinois Central is playing for an entrance here.

The shipments of Iron from this district during April were 78,435 tons, and from Alabama and Tennessee they were 138,427 tons. Of Cast Iron Pipe there was shipped 14,953 tons, of which 7710 tons went from Birmingham. The shipments of export Iron were only 1412 tons, and this was simply a cleaning up of old business. There is, as yet, no sign of any life in that branch of the trade.

New York.

Office of *The Iron Age*, 232-238 William street, NEW YORK, May 15, 1901.

Pig Iron.—The local market continues quiet. Some large lots for future delivery are being offered by furnace interests, which are expected to largely increase production early in the second half of the year. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, $16.50 to $17.50; No. 2 X, $15.40 to $16; No. 2 Plain, $14.25 to $14.50; Gray Forge, $14 to $14.50; Tennessee and Alabama brands, No. 1 Foundry, $16 to $16.25; No. 2 Foundry, $15 to $15.50; No. 1 Soft, $16 to $16.25; No. 2 Soft, $15 to $15.50; No. 3 Foundry, $14.50 to $14.75; No. 4 Foundry, $14.25 to $14.50; Gray Forge, $14.25 to $14.50.

Cast Iron Pipe.—The largest transaction closed for some time past on the seaboard was the 16,800 net tons for Philadelphia, which went to the Consolidated Company about ten days since. A good amount of work is to come up locally and the run of small orders is very fair. There has been some talk of a common sales agency in Cast Iron Pipe, but there is apparently little chance of its going through. We continue to quote $23 to $23.50 per gross ton, at tidewater.

Steel Rails.—Very few new orders are being taken in this district. It is understood that the Eastern mills are so crowded with work that they have turned down a very large tonnage. The manufacturers of Track Bolts are still discussing the plan of a common sales agency for all the leading concerns. We quote $28 for Standard Sections, and $32 to $32.50 for Girder Rails. We quote Spikes, 1.80c. to 1.85c; Splice Bars, 1.45c. to 1.50c.; Square Track Bolts, 2.35c. to 2.40c., and Hexagon Bolts, 2.45c. to 2.50c., at mill.

Finished Iron and Steel.—Among the larger contracts recently placed is the 5000 tons of Shapes and 3000 tons of Plates for the Weehawken grain elevator, the material to be placed with the American Bridge Company. The same company have also taken 3000 tons of Structural Material for the Lake Shore shops at Collinwood, Ohio, near Cleveland. A contract has also been closed for 12 bridges for an anthracite coal road, involving a considerable tonnage. It is not known to whom the contract for the two large holders for the Consolidated Gas Company is to go. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held a. 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.50c. to 1.60c.; Common Bars, 1.45c. to 1.50c.; Soft Steel Bars, 1.62½c. to 1.65c., and Hoops, 1.90c. to 2c., base, on dock.

Metal Market.

Office of *The Iron Age*, 232-238 William street, NEW YORK, May 15, 1901.

Pig Tin.—During the early portion of the week under review a greater inquiry from the interior was noticed. But the demand was filled at prices lower than those quoted on the Metal Exchange. During the last few days demand has slackened somewhat, and business has been rather dull. The market to-day closed weak at 26.10c. to 26.50c. for spot, 26c. to 26.50c. for May, 26.20c. to 26.40c. for June, and 26c. to 26.25c. for July. Stocks here are now so plentiful that for the first time in many months there is a premium on future delivery over spot. In London and Holland the new bull operator was at work and succeeded in raising prices considerably during the early portion of the week, but the upward movement was checked to-day, presumably through the present weakness of our market. The closing price in London to-day was £121 15s. for spot, and £118 10s. for futures. The Bileton sale to-day at Batavia, which comprised about 6000 piculs, or 350 tons, went at an equivalent of £120, c.i.f. Holland. Toward the close of this month about 2500 tons of Banca will be sold at auction in Holland. The unsold stock of Banca held by the trading company in Holland is attracting considerable attention, as it is the largest on record. On April 30 there was stored in Holland 8837 tons, against 5067 tons for the same period last year, and 3807 tons for the same period of two years ago.

Copper.—There is no change in the situation here. Producers hold at the same prices, but the market is extremely dull. Lake is quoted 17c. and Electrolytic 16⅝c. The principal Lake producer, it is said, is still trying to effect a large sale, but has not succeeded in doing so. The exports for the first half of this month amount to 3962 tons, as against 5696 tons for the corresponding period of last year. The imports for the first half of this month amounted to 1327 tons. The London market continued to decline during the week and closed to-day £69 8s. 9d. for spot and £70 for futures. Best Selected is unchanged at £75 15s. Consumption in Europe continues on a much smaller scale. The United States Consul at Berlin, in a communication to this Govern-

ment dated early last month, states that the price of Copper is considered too high by comparison with the existing values of other commodities He expresses the opinion that if American prices should be reduced to 14c. a revival of European demand could be expected.

Pig Lead.—A fairly good demand is reported at unchanged prices. The independent producers are said to be pretty well sold up. The American Smelting & Refining Company are quoting on a basis of 4.37½c., New York, and 4.32½c., St. Louis. The London price is 3 shillings and 6 pence lower than last week, with £12 3d. 9d.

Spelter—Is very quiet here at 3.95c. to 4c. It is stated that 200 tons of American Spelter came back from England during the last week. The London market has advanced somewhat, and is quoted to-day £17 5s. St. Louis is dull at 3.85c.

Antimony—Is unchanged. Hallett's is quoted 8¾c. to 9c., Hungarian 8¼c. to 8¾c., and Cookson's 10¼c.

Nickel.—Lots not covered by yearly contract are not obtainable under 60c.

Quicksilver.—There is no change. Prices quoted here are $51 per flask of 76½ pounds for lots of 50 flasks or more. The London market is unchanged at £9 2s. 6d.

Tin Plate.—The demand is fair, and prices are unchanged. The American Tin Plate Company continue to quote deliveries until October 1 on a basis of $4.19 per box of Standard 100-lb. Cokes, f.o.b. New York, and $4 per box f.o.b. mills.

The New York Machinery Market.

Office of *The Iron Age*, 239-243 William street.
New York, May 15, 1901.

There is a good deal of gossip in the street about a large conservative firm of machine tool builders who are said to have adopted a new policy in their sales department and are now reducing prices. All through the boom times, when machine tool builders throughout the country siezed the opportunity of advancing prices, this company left them unchanged. That the present reductions have had an influence on the values of other makes of tools is denied in all quarters of the market. The declines, it is said, figure more conspicuously in certain lines or types of tools, and are not uniform throughout the entire extensive line of the firm's product. It is reported that the declines average above 10 per cent., when the various lines affected are considered collectively. In some tools the reduction has been greater than in others. For instance, it is said that recent sales have been made in milling machines at a reduction of about 20 per cent. below the former standard prices. In grinding machines it is also said that the decline has been marked.

The representatives here for builders of other prominent makes of milling machines state that they have not made any change in prices. The trade in general state that no depressing effect has been felt in the market for standard tools, and that conditions are such that they do not warrant a general decrease in prices. Some builders apprehend difficulty with their workmen in connection with the threatened strike of next Monday. Builders of heavy tools state that the tendency in prices is rather upward instead of otherwise.

We are informed that the Cincinnati Milling Machine Company are now building for the market their new type of back geared machines. One of these machines was exhibited at the Paris Exposition, but the machines have not been heretofore placed upon the market. This type of machine contains a new geared feeding device which does away with all feed belts. The machine also embodies other changes.

We have received official confirmation of the report which we printed last week to the effect that the Cincinnati Milling Machine Company were awarded the contract for about 60 milling machines to be installed in the new British Westinghouse shops. As to the report that the Lodge Shipley Machine Tool Company received a large order for lathes to be installed in these works, we are in receipt of a communication from the latter company which states that no order has as yet been received by them for the lathes.

There has been considerable correspondence between machine tool merchants and the railroads for large equipments for new shops, but it is now thought that some of this work may be held up temporarily owing to the recent Wall street flurry. One of the latest tips given out in the trade is that the Vermont Central intend erecting extensive shops in the neighborhood of Northern New York State.

Another report in the trade has it that the Pullman Palace Car Company intend doubling the size of their present repair shops at Wilmington, Del., and that places are now being prepared for the buildings.

It is said that the Pennsylvania has plans under way for extensive car shops to be built on a large tract of land just purchased between Southeast Toledo and Walbridge, Ohio. W. H. Brown, chief engineer of the road at Philadelphia, is said to have this work in charge.

Extensive repair shops are to be built at Collingwood, near Cleveland, Ohio, by the Lake Shore & Michigan Southern Railway Company. The plans for this work are said to be pretty well advanced and some purchases have already been made. The contract for the buildings has been let. The Philadelphia Engineering Company, branch of the Niles-Bement-Pond Company, are said to have secured the crane order. There will be four cranes, a 100-ton electric traveler, a 30-ton, a 10-ton and one 7½-ton jib crane. The machinery used in the new shops will all be driven electrically. Specifications for the power plant are already completed. The plant will have a capacity of 1800 boiler horse-power. There will be a 400-kw. and an 80-kw. generating set, and also an air compressor with a capacity of 1300 cubic feet. The principal buildings will be a locomotive shop, blacksmith shop, wood working shop, machine shop, paint shop and power house. The buildings will be of steel construction.

At Mechanicsville, N. Y., the Boston & Maine is erecting a new system of shops, and the buildings are now under construction. Some of the machinery has been purchased, but there is a large quantity yet to be secured.

T. S. Tutwilder, chief engineer of the Savannah, Florida & Western Railroad, whose office is located at Savannah, is inquiring about wood working machinery, preparatory to drawing plans for new pattern shops which will be built in that city by the railroad company. The new shops are to replace those recently destroyed by fire. Judging from the present information, the new shops will be rather extensive.

The work which has for some time been deferred in connection with the new repair shops to be erected in connection with the extension of the Tehuantepec Railway at Coatzacoalcos, Mexico, is now apparently going ahead. Milliken Brothers of 11 Broadway have received the order for the structural material required in the buildings. F. Stuart Williamson, who is the engineer and agent for S. Pearson & Sons of England, who are the general contractors building the road, is now located at 203 Broadway.

Richard D. Foote, vice-president of the National Iron Bank of Morristown, N. J., states that the syndicate which proposes to build a trolley line from Newark and Elizabeth to Summit and thence to Lake Hopatcong, N. J., expect to commence actual operations within a few weeks. Two large power stations will be built. One will be located at Morristown. It will be equipped with turbines so as to utilize water power in addition to the steam plant whenever it is possible. The exact location for the other station has not been decided upon. It will probably be built at the northern end of the route. John I. Waterbury of Morristown, and Senator John Kean of Elizabeth, N. J., are interested in the project.

The Weston Electrical Instrument Company have removed to their new plant at Waverly, N. J., and are now buying additional new machine tools. It is stated in the trade that they are replacing many old type machines with those of later pattern.

The Guerber Engineering Company of Bethlehem, Pa., are installing a new plant and are purchasing a con-

siderable quantity of medium sized machine tools. A large purchase was made during the last few days.

The Weaver Organ & Piano Company, who are about to erect a large plant at York, Pa., are obtaining estimates on the machinery which will be required. They state that their plant will consist of four buildings, one four stories high, 60 x 162 feet, another four stories and 40 x 60 feet, one three stories, 40 x 50 feet, and a power plant, one story and 50 x 80 feet.

The Needham Piano & Organ Company of Washington, N. J., intend building a new plant nearer to save railway line. We are informed that they are considering Paterson, N. J., favorably.

It is reported that the Underwood Typewriting Company of Bayonne, N. J., are considering a proposition to remove to a new plant at Hartford, Conn. This company, it will be recalled, have recently installed a large number of modern machine tools and suffered considerably by a recent fire.

The Keystone Driller Company, Box H, Beaver Falls, Pa., are in the market for machinery to equip a large extension to their plant. A 60 x 100 foot addition will be built to the boiler plant and two new buildings, each to be 40 x 200 feet, will be used as wood working and erecting departments respectively. Machine tools, wood working machinery, boilers, a gas engine and equipment for an electric light plant are required.

Another machine tool show room has been opened in lower Liberty street. The Bullard Machine Tool Company of Bridgeport, Conn., have engaged the southeast corner store of the Liberty Building, on the corner of Liberty and Washington streets, and will shortly place several machine tools on exhibition. The store is located at 139 Liberty street and is operated under the direction of N. B. Lyons, who, for a number of years, has been in charge of the business of the company in the metropolitan and surrounding territory. The office at 120 Liberty street has been vacated.

A Co-operative Sheet Steel Mill.

At the Boston convention of the National Association of Stove Manufacturers the president, S. Boal of Piqua, Ohio, dealt as follows with the question of a co-operative sheet mill:

If the use of sheet steel continues to increase in the manufacture of stoves and ranges as rapidly as it has during the past few years, a sheet mill will soon be of as much importance to a stove plant as is the molding shop. Since the production of sheet steel has been controlled by one company the profits in its manufacture are very large, and under present conditions will continue to be so indefinitely. Therefore, if 25 or 30 of us would form a company and each subscribe from $10,000 to $15,000 of the capital stock, amounting to about $300,000, it would be quite sufficient to build a thoroughly modern sheet mill, the entire product of which would be consumed by the requirements of its own stockholders, who would receive in good dividends the profits on the output of the mill. The services of a thoroughly experienced and capable man to manage such a mill can now be easily obtained, there being a number of them who would be pleased to engage in such an enterprise and subscribe to the capital stock to such an extent as would be agreeable to the other stockholders. The extensive use of steel in the manufacture of our product has caused innovations in our business to such a pronounced extent that it has materially changed the method of figuring cost as adopted by this association and used so extensively by our members; therefore, a committee could wisely be appointed to formulate a plan for figuring costs that would be applicable to the present conditions.

The Struthers Sheet Mill.—PITTSBURGH, May 15, 1901.—(*By Telegraph.*)—The American Sheet Steel Company have given further evidence of their intention to centralize their sheet plants by the announcement of arrangements to be made at their large sheet mill at Struthers, Ohio. Recently a fifth mill was added to this plant, and the American Sheet Steel Company have just decided to add another mill, making six in all. Work on this sixth mill will be started in a short time.

OBITUARY.

PHILIP S. JUSTICE.

Philip Syng Justice, who died in London, England, on May 5, was a well-known business man and manufacturer of Philadelphia a generation ago. Mr. Justice, who was 82 years old, and whose death was due to the infirmities of age, was of Quaker extraction. He was born in Philadelphia, and after finishing his education, served an apprenticeship at the wholesale hardware business at his father's store. When about 25 years old he associated himself with Daniel Steinmetz in similar business, under the firm name of Steinmetz & Justice. About 1855 he withdrew, and established the firm of Philip S. Justice & Co., as dealers and importers of heavy railway material, and, it is claimed, imported and introduced to the railways the first steel rails ever laid in America, as well as the steel locomotive tires. About 1866 he decided to start works for the manufacture of steel tires in this country, and, with the aid of the Philadelphia & Reading Railway and a few friends, he erected what was then called the Butcher Steel Works, at Nicetown, and now known as the Midvale Steel Company. He was the first president of these works, which were started in a modest way, but which laid the foundation for the present immense establishment. For the past 25 years Mr. Justice had resided in London.

NOTES.

ROBERT L. STOKES, president of the Fulton Foundry & Machine Works of Atlanta, Ga., died on April 30 at his home in that city, after a brief illness, from pneumonia.

EDWIN TRACY HUNTINGTON, a pioneer manufacturer of Rochester, N. Y., died on May 4 in that city, aged 86 years. Mr. Huntington was formerly a member of the firm of Briggs & Huntington, manufacturers of safes, and was also one of the founders of the Charlotte Iron Works of Rochester. He retired from business a number of years ago.

SANFORD M. BURNHAM, a prominent citizen of Akron, Ohio, and for many years secretary of the Webster, Camp & Lane Machine Company of that city, died suddenly of heart disease on May 9, at the age of 77 years. He was born in Genesee County, New York, and had lived in Akron since 1848.

There are some comical features in the present oil boom in Texas. A special correspondent of the New York *Times*, writing from the field, says: "It happens that Beaumont is situated right in the heart of the valuable oil district, and prospectors attempted to discover just how much city lots were worth. The tapping of a well would have flooded the city with oil, and the City Council promptly put a stop to boring anywhere within city limits. Then investors grew suddenly thirsty. Applications poured in to the council for permission to sink artesian wells. The council turned down these applications and pointed to the Neches River. Or they could catch rain water, as other Southern towns did. This reply does not satisfy."

The Solid Steel Tool Company, Chicago, report that the demand for their masons', mining and railroad tools is increasing, and that their plant is taxed to its utmost capacity in trying to keep up with orders. The company have a fine trade in the Philippine Islands, and Fressel & Co., Manila, have been appointed to look after their interests.

J. B. Doan & Co., dealers in brass and iron working machinery, Chicago, have removed their offices and warerooms from 68 South Canal street to 34 and 36 South Canal street, corner Washington. Their new location gives them twice as much room as they formerly occupied, and they will carry a larger stock of the latest machine tools.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING MAY 15, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing quotations.	Sales.
$10,000,000	Am. Bicycle Co., Com....	.....	7 - 7¼	.....	7 - 7½	.....	- 6¾	6¾	1,300
20,000,000	Am. Bicycle Co., Pref....	.....	32¾-33	.....	33 -34½	.....	-31	31	1,400
10,000,000	Am. Bicycle Co., Bonds...	.....	-82	.....	.....	.....	.....	...	2,000
29,000,000	Am. Car & Foundry, Com.	20 -24	22 -24	.....	24 -24¾	23½-24	21¼-23¾	23½	17,800
29,000,000	Am. Car & F'ndry, Pref.§..	75 -79	76 -78	.....	76½-77	76¼-77	75½-77	76¾	9,400
7,500,000	Bethlehem Iron†.....	.....	.....	.....	.....	-63	-63	...	182
16,000,000	Cambria Steel**.....	18¼-23¾	21 -23	.....	24¼-25½	23½-24½	-23½	...	10,334
7,974,550	Cambria Iron, Phila.*....	.....	.....	.....	.....	.....	.....	...	.....
16,000,000	Cambria Steel**.....	18¾-23¾	21 -23	.....	22½-23⅝	20⅞-22¾	19¾-21	21¼	52,759
17,000,000	Colorado Fuel & Iron....	85 -95	89 -91	.....	94 -96½	89¾-92¾	87½-90½	90½	8,200
24,410,900	Crucible Steel, Com.....	.....	-24½	.....	.....	.....	.....	...	100
24,399,500	Crucible Steel, Pref.....	.....	.....	.....	.....	.....	.....	...	.....
1,975,000	Diamond State Steel‖....	5½- 6⅝	5½- 7	.....	6¼- 6⅝	6 - 6¼	- 6	...	5,545
15,000,000	International Pump, Com.	30½-36	36 -38	.....	36½-39	37¾-38	36½-37	37	6,700
12,500,000	International Pump, Pref.	-78	.....	.....	-81	.....	-80	80	300
11,000,000	International Silver.....	- 6	- 6	.....	.....	.....	.....	...	800
5,000,000	Penna., Com., Phila.....	.....	.....	.....	.....	.....	.....	...	.....
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	...	.....
12,500,000	Pressed Steel, Com.....	37½-40⅛	38 -43	.....	41 -42	41 -42⅛	41 -42½	42¼	10,400
12,500,000	Pressed Steel, Pref.....	80 -82	79 -82½	.....	82¼-82½	82¾-83¼	82 -82½	82½	5,500
27,191,000	Repub. Iron & Steel, Com.	15 -18½	16½-19	.....	18 -19	17 -18⅝	17 -17½	17½	12,300
20,306,900	Repub. Iron & Steel, Pref.	67 -71½	70½-76	.....	73 -73¾	72 -73	70¾-71½	71½	6,100
7,500,000	Sloss-Sheffield S. & I.,Com.	36 -38	-37	.....	-37½	36 -36½	-35	35	1,100
6,700,000	Sloss-Sheffield S.&I.,Pref.§	.....	.....	.....	.....	.....	.....	...	300
20,000,000	Tennessee Coal & Iron....	50 -58	53 -58	.....	56½-59	51¼-56⅞	50 -53¼	53	25,800
1,500,000	Tidewater Steel‖.....	.....	.....	.....	7 - 7½	.....	- 7	...	948
425,000,000	U. S. Steel Co., Com.‖‖...	24 -48	41 -45	.....	44 -46	41⅛-44¾	39¼-43⅛	43	987,900
425,000,000	U. S. Steel Co., Pref.‖‖...	69 -98	90 -94	.....	92 -93¼	89¾-92	88¼-91	90¾	920,600
1,500,000	Warwick I. & S.‖.....	6¾- 7	.....	.....	- 7	.....	- 7	...	600

Preferred stocks 7 % cumulative unless otherwise stated. § 7 % Non-Cu. ‖ Par $10. ‡‡ Par $50, $1 paid in. ‖‖ Authorized Capital $550,000,000 Common; $555,000,000 Preferred; * Par $50. ** $10.50 per share paid in. † 6 % guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph.

Bonded Indebtedness: American Bicycle Co., $10,000,000 sinking fund gold debentures 5 %; Cambria Iron Co., $2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Diamond State Steel Co., property leased from Diamond State Steel Co. at 4 % on $1,000,000, $6.25 on Steel stock paid in, $1.25 called for June 1st, total capital $2,000,000; Tennessee C., I. & R. R. Co., $8,867,000 6 %, $1,114,000 7 %, $1,000,000 7 % cu. pref.; Pennsylvania Steel, $1,000,000 5 % Steelton 1st, 1917, $2,000,000 5 % Sparrow's Point 1st, 1922, $4,000,000 consolidated, both plants; Bethlehem Iron, $1,951,000 5 % maturing 1907, interest and principal guaranteed by Bethlehem Steel Co.; Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co., Col. Fuel Co. Gen. Mort. 6 % $850,000, Col. Coal & Iron Con. Mort., 6 % $2,810,000, Col. Fuel & Iron Gen. Mort. 5 % $2,308,000, also outstanding $2,000,000 preferred stock; Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6 %, $2,000,000, Sloss I. & S. general mortgage 4½ % $2,000,000. U. S. Steel Corporation $304,000,000 5 % gold bonds, also Am. S. & W. Co. $180,656, Federal Steel Co. $9,822,000 Illinois 5 %, $7,417,000 E. J. & E. R. R. 5 %, $1,600,000 Johnson 6 %, $6,782,000 D. & I. R. R. R. 5 %, $1,000,000 2d D. & I. R. R. R. 6 %, $10,000 land grant D. & I. R. R. R. 5 %; National Steel $2,561,000 6 %.

Iron and Industrial Stocks.

The collapse in the stock market on Thursday last caused a heavy decline in United States Steel stocks, with a large volume of business, the lowest point, however, being maintained only for a brief period. There was a sharp reaction on Friday and on Monday, followed during the last two days by continued liquidation. Report has it that conferences among the directors have brought out the feeling that a dividend on the common should be paid in July. There seems to be some difference of opinion as to whether a rate of 4 per cent. or of 5 per cent. should be fixed. Bethlehem Steel stock has been quite active and strong on the reports of the merger.

	Bid.	Asked.
E. W. Bliss, common	140	..
E. W. Bliss, preferred	125	..
Cramp's Shipyard stock	78	80
Dominion Iron & Steel Company	33¼	35
Empire Iron & Steel, common	6	8
Empire Iron & Steel, preferred	34	45
National Enam. & St., common	22	24
National Enam. & St., preferred	82	84
New Haven	4⅞	5
Otis Elevator, common	29½	30½
Otis Elevator, preferred	91	93
Pratt & Whitney, preferred	85	90
U. S. Cast Iron Pipe Company, common	7½	8
U. S. Cast Iron Pipe Company, preferred	39½	41
U. S. Projectile	115	..
Va. C. I. & C., stock	6	8
Va. C. I. & C., bonds	50	53
H. R. Worthington, preferred	110	114

At Pittsburgh the Farmers' Deposit National Bank have placed privately an issue of $1,500,000 first mortgage 5 per cent., 15-year gold bonds of the Harbison & Walker Company, at 104½. The bonds are payable at the rate of $150,000 a year after five years at 105, and are redeemable on three months' notice given previous to any interest period at 105. The Harbison & Walker Company are large manufacturers of fire brick, and have offices in the Park Building, Pittsburgh.

The stockholders of the Danville Bessemer Company at their annual meeting at Philadelphia voted in favor of the cash distribution of $1 per share and a reduction of the par value of the shares from $5 to $1.50, making the capitalization $360,000, instead of $1,200,000. According to the report of the president, the company are free of all debts and have $145,000 cash on hand, exclusive of the $240,000 to be distributed. The total assets are given at $400,000. J. J. Macdonald was elected president, Col. A. Louden Snowden vice-president, and H. N. Day secretary and treasurer.

Dividends.—The Pratt & Whitney Company have declared a dividend of 1½ per cent. on the preferred stock.

The Standard Chain Company of Pittsburgh paid a dividend of 1¾ per cent. on the preferred stock on May 15.

After hearing the argument of the counsel on the application to make permanent the injunction restraining the American Smelting & Refining Company from turning over to M. Guggenheim's Sons the $45,000,000 of stock which was to be paid for the Guggenheim plant, Judges Kilpatrick and Gray dismissed the injunction. They held that the court was without jurisdiction. The hearing was held before the United States Circuit Court in Trenton, on Monday last. The Smelting Company interposed as a defense lack of jurisdiction, also contending that, the transfer of the property having already been made by M. Guggenheim's Sons, it was too late to enjoin the transfer of stock and the consummation of the contract.

The blast furnace employees in the Mahoning and Shenango valleys have asked the furnace operators to bank down the furnaces on Labor Day for 24 hours. This is an unusual request, and may not be granted.

Henry G. Prout, editor of the *Railroad Gazette;* A. P. Boller, and T. C. Clarke have been appointed members of a board of engineers to prepare plans for extending the Manhattan entrances to the Brooklyn Bridge.

The Machinists' Demands.

A special circular letter has been sent to the members of the National Metal Trades Association by Secretary Henry F. Devens. It is in part as follows:

The Circular of the Metal Trades Association.

At a meeting of the Administrative Council of the National Metal Trades Association, held at the Murray Hill Hotel on the afternoon of May 11, a conference was held with Messrs. O'Connell and Wilson, representing the International Association of Machinists, accompanied by other members of their organization.

At this meeting, after a long discussion of many matters pertaining to the conduct of our business, President O'Connell asked the following questions and received thereto the following replies:

Question: Is the Administrative Council authorized to handle the wage question for its members and decide it with us ?

Answer: We have no such authority.

Question: Is the National Metal Trades Association—the Administrative Council representing the National Metal Trades Association—prepared to arbitrate all the wage questions that may be referred to it ?

Answer: Yes, through its arbitration commission it is prepared to arbitrate all questions arising under the New York agreement and the joint resolution of November 16, 1900.

Question: What is to be done in the case of firms who have not notified that they referred ? (Memo.—Mr. O'Connell meant by this question to ask what disposition would be made of cases of firms who had not notified the International Association of Machinists that they intended to refer the matter for arbitration.)

Answer: All members of this association will be notified immediately to conform to the New York Agreement and joint resolution of November 16, 1900, failing in which they will not be supported by this association.

After the above questions and replies thereto were duly noted by stenographers, a copy of the questions and answers as above were presented to President O'Connell, together with a resolution prepared by the Administrative Council, reading as below:

"*Resolved*, That in case the employees of any shop make a demand for higher wages and their employers fail to agree with them and same is passed up to arbitration, as called for in the New York agreement and joint resolution of November 16, 1900, that the findings of said arbitration board shall date back to May 20, 1901, and the matter must be arbitrated as soon as possible."

It was thought best to present this resolution to President O'Connell and his associates in order that they might understand that the Administrative Council representing themselves and the National Metal Trades Association intended to and do adhere strictly to the New York agreement and the joint resolution of November 16, 1900, which provides for all matters in dispute, which, it was considered by the Administrative Council, included the wage question.

Many of the members of the National Metal Trades Association in addition to being served with a request for an advance of 12½ per cent. in wages, were also presented with a form of agreement, which so modified and altered the New York agreement and the joint resolution of November 16, 1900, that the following joint resolution was also presented to President O'Connell and his associates for action:

Joint Resolution.

"*Whereas*, The National Metal Trades Association and the International Association of Machinists have been greatly confused by the presentation to the members of the National Metal Trades Association of a demand for individual agreements; and,

"*Whereas*, The International Association of Machinists and the National Metal Trades Association have an agreement which is in force; and,

"*Whereas*, It is stated that these individual agreements were presented to the members of the National Metal Trades Association by error,

"*Be it Resolved*, That all action taken heretofore on those individual agreements be reconsidered and voided;

"*Be it Further Resolved*, That the question of wages be considered separately."

After a few minutes' absence from the room for consultation with his associates President O'Connell returned to notify the Administrative Council that he had expected an immediate action on the part of the Administrative Council to the wage matter, and as the Administrative Council were not prepared to make a positive answer as to whether or not the 12½ per cent. advance in wages would be agreed to, to take effect May 20, he was compelled to leave without giving any decision to the Administrative Council to any of the papers submitted to him, and left the room, stating that he could be addressed at Washington, if we wished to reach him after to-morrow (Sunday).

At a later meeting of the Administrative Council the following resolution was presented and adopted:

"*Resolved*, That it is the sense of this meeting that no increase in wages be granted to the employees in the shops of the members of this association prior to arbitration, but that all matters in dispute between the International Association of Machinists and the National Metal Trades Association must be disposed of under and according to the New York agreement and the joint resolution of November 16, 1900."

In order that members may fully understand the correct interpretation of the above resolution, the following explanation is hereby given: A member has the right to make any settlement with his employees on the question of wages which he deems best for his own interests, and this resolution does not in any way bind a member not to increase his wages, but in view of the attitude taken at this meeting by those representing the International Association of Machinists, it was the opinion of your Administrative Council that no further concessions should be granted to the members of the Machinists' Union, as from present indications it is more than probable that a strike will take place in this country on May 20.

There will be a meeting of the members of the Second District of the National Metal Trades Association, which comprises New York and New Jersey, at the Astor House, New York, at 10 o'clock on Friday morning, May 17. As far as has been learned by the association only two of its members in this district have acceded to the demands of the men. They are the Lidgerwood Mfg. Company, and the E. W. Bliss Company of Brooklyn.

An Interview with James O'Connell.

WASHINGTON, D. C., May 14, 1901.—After a two days' conference in this city between the representatives of the machinery and allied trades national and international unions, the programme adopted by the National Association of Machinists at New York, looking to a nine-hour working day with ten hours' pay, was formally indorsed, and the officers of the national bodies assert that unless their demands are complied with there will be a general strike on May 20, which, however, they believe will be averted by the action of employers in making concessions in advance. It is claimed that a number of such concessions have already been promised, sufficient, in fact, to deprive the movement of its significance in certain parts of the country.

Those participating in the conference held in this city were James O'Connell, president of the National Association of Machinists; John Mulholland, president of the National Association of Allied Metal Mechanics; L. R. Thomas, president of the Pattern Makers' League of North America; E. J. Lynch of the Metal Polishers', Buffers' and Brass Workers' Union of North America, and Samuel Gompers, president of the American Federation of Labor. Upon the adjournment of the meeting the following brief official statement was made public:

"It was decided that all workers in the machinery and allied metal trades should demand the nine-hour day, without reduction in pay, before May 20, the same to go into effect on that date. The officers of the organization decided that the men in their respective trades

would stand by each other in the enforcement of the demand should it be necessary to cease work. In view of the encouraging reports received from a large number of employers in the trade having already notified their employees of the concession to the above demand, no serious opposition to the movement is anticipated."

Supplementing this brief statement, President O'Connell said to the correspondent of *The Iron Age:*

"Our present advices indicate that there will not be a protracted strike and that in many parts of the country there will be no strike at all. During the day I have had telegrams from several cities indicating that a large number of firms have signed agreements granting our requests. The reports from New York, Chicago, Indianapolis, New Orleans, Omaha, and other cities are particularly encouraging. Every firm in Omaha has signed, and 12 firms in New Orleans, besides a much larger number in the more important cities, giving us reason to believe that before May 20 we shall have agreements with at least 25 per cent. of the employers.

"It should be borne in mind in connection with this movement that we are dealing with two classes of employers, those who are members of the National Metal Trades Association and those who are not. As to the former class there is no controversy concerning hours of labor, as the agreement made with our association a year ago covered that point specifically and guaranteed us a nine-hour day after May 18, 1901. We are asking all other employers to give us the shorter day, and our request, addressed to employers both in and out of the association, is that the now nine-hour day will carry with it a practical increase of 12½ per cent. The point has been made that our agreement with the Metal Trades Association requires the arbitration of the wage question, and this we concede, but not quite as the employers view it. The officers of the Metal Trades Association insist that the question of wages shall be treated as a local matter, to be adjusted independently by each local organization negotiating with local employers. It would take years to secure any results from such a method of negotiation, and we therefore maintain that the spirit of the agreement made a year ago calls for the settlement of this important question between the national associations of employers and men.

"The International Association of Machinists, which is taking the lead in this matter, is working for the allied trades as well, and will have their unqualified support. This does not mean that there will be a general strike in all these trades, but simply that wherever it may be necessary they will throw in their lot with us. I have no doubt that in many parts of the country it will not be necessary to call upon them, but if it is, we are assured they will stand by us loyally. We feel that the machinists should take the lead this time because we think they have been treated with less liberality than almost any other class. The machinery business was never in more prosperous condition than to-day, and yet very few employers have been willing to make any advance in wages or to reduce the hours of labor, although when times were hard they cut wages on that account. Aside from the work which our local bodies are doing to secure pledges from employers to grant our requests on May 20, there are no general negotiations on foot, and no prospect that the strike can be averted except by compliance with our very reasonable demand."

With regard to the success which has attended the joint agreement between the National Metal Trades Association and the International Association of Machinists, Mr. O'Connell said that, while not so complete as was hoped, it was nevertheless very gratifying, and, all things considered, represented great progress in the general movement to prevent labor disturbances. Its phraseology was in need of amendment, he thought, to make its provisions more specific on certain points, but these changes were not material and could very easily be made. W. L. C.

The Situation Among Chicago Machinists.

CHICAGO, May 13, 1901.—The Illinois Central Railroad Company have averted a strike of their machinists by making an advance of about 9 per cent. in the men's wages. The announcement was made on the 11th inst. This advance would bring the minimum to about 29 cents an hour, while the union wants a straight 30-cent scale. There yet remain to be settled the length of the work day, whether nine or ten hours, the apprentice question, and other less important matters, and a conference has been arranged to consider these questions. The men want a straight nine-hour day, while the road demands that they work ten hours when necessary, contending that inasmuch as they are only called on to work eight hours during certain parts of the year they would be only working on an average of about nine hours under the conditions proposed by the company. The men are willing to work ten hours, but want time and a half pay for the extra hour.

Under the wage concessions now made machinists would receive from $2.50 to $2.90 a day, the latter sum being the minimum offered in Chicago. The offer provides for three grades of men in the Burnside or Chicago shops and some other points along the road. These are to receive $2.90, $2.95 and $3 a day, which would represent a minimum scale of 29, 29½, and 30 cents an hour.

FAVOR ARBITRATION SCHEME.

Action taken Saturday night by a mass meeting of Chicago machinists indicates that there will be no strike of that trade on May 20, even if the members of the National Metal Trades Association refuse to grant the 12½ per cent. advance which the machinists have decided to demand. A resolution was adopted which provided for arbitration in case the demand be refused.

This arbitration is to take place within two weeks after the demand is made, and is to be conducted by District No. 8 of the International Association of Machinists and District No. 5 of the National Metal Trades Association. Nearly 1000 machinists attended the meeting.

It is stated by the machinists that the employers are prepared to concede an advance of 10 per cent., and it is thought this will be the basis of settlement.

According to the *Crockery and Glass Journal*, metallic surfaces may be coated with glass by melting together 125 parts of flint glass fragments, 20 parts of sodium carbonate and 12 parts of boracic acid. The molten mass is next poured on some hard and cold surface, stone or metal, and after it has cooled it is powdered. Make a mixture of this powder and sodium silicate (water glass). The metal to be glazed is coated with this and heated in a muffle or other oven until the mixture melts and can be evenly distributed. This glass coating, it is said, adheres firmly to iron and steel.

The Pneumatic Scale Company have organized at Kittery, Maine, for the purpose of manufacturing electrical, mechanical and pneumatic machinery, novelties, &c., with $1,000,000 capital stock, of which nothing is paid in. The officers are: President, Joel F. Shepard of Braintree, Mass.; treasurer, W. H. Doble of Quincy. Certificate approved May 6, 1901.

It is stated that the Count Da Schio is engaged in Italy in the construction of a new air ship. The experimental vessel will measure only about 100 feet in length, and will have accommodations for two passengers. The power for propelling the vessel will be placed in the fore part of the car. Should the preliminary trial prove successful the Count proposes to construct a larger machine, and it is quite possible that the Duke d'Abruzzi may take one of them with him upon his next Arctic expedition.

The Standard Electric Company of California have just completed the installation of one of the longest power transmission systems in the country. The circuit extends from Blue Lakes, in Alpine County, to San José and Oakland, and covers a distance of 352 miles.

The business men of Manistee, Mich., have organized a Bureau of Publicity and Promotion, and are offering inducements to manufacturers to locate in that city.

HARDWARE.

THE course of things in the trade during the present period of active business and of fortunate reaction from the low prices developed in times of depression and under the stress of competition is tending to correct some abuses which had become apparently firmly rooted. In the many years in which the market was, with occasional brief exceptions, a buyers' market, with a constant trend toward lower values, a very loose and one-sided system of placing and accepting orders prevailed. Buyers were allowed to purchase large quantities of goods on vague and unspecified orders with an understanding, expressed or implied, that shipment was to be at the pleasure of the purchaser, and indefinitely deferred if he so desired, and that the order or any unfilled part of it might, indeed, be canceled by him at will if the market should go against him or if for any reason he did not desire the goods. Even this one-sided arrangement was not always sufficiently in the buyer's favor. He usually insisted on a guarantee against decline, and frequently claimed the privilege of adding to the order in case the market advanced. These lax methods on the part of manufacturers have in large measure been corrected by the recent course of the market.

The experience of manufacturers who, on the upward movement of values two years ago, found their books encumbered with orders of the character referred to above was far from agreeable. The execution of orders placed and accepted, with perhaps little thought that all the goods were to be taken, was insisted upon by the purchaser. In some cases these orders were so general in their scope as to cover not a specified quantity of goods, but the buyer's requirements for the season or the year, and with the rapid and radical rise in the market were interpreted by the buyers with great liberality. As the result of this system, and the extent to which it prevailed, it is a well-known fact that many manufacturing concerns during a year of great prosperity were working on old orders, many of which were executed at serious loss. The manufacturers thus learned a lesson that they are not likely soon to forget. The system which made such things possible may be regarded as a thing of the past. Whether, when the market again takes a downward turn and orders are again eagerly sought, there is to be a return to this unbusinesslike way of doing things remains to be seen.

One of the influences which prevent manufacturers from accepting blanket orders for future execution is the difficulty of securing themselves against increased costs in material and labor. In the present condition of things, when in a good many lines it is not easy to obtain material to satisfy present needs, it is a difficult matter to cover their future requirements. This fact, with the large current business, acts as a salutary restraint against contracts which have long to run. The labor question has also its influence. The possibility of increased cost in this important element of production is constantly before the mind of the far seeing manufacturer. The disturbance of existing relations between employers and employees, and the necessity for paying higher wages for perhaps less work, are matters which must be taken into account. The tendency of these united influences is in the direction of conservatism on the part of the manufacturers.

When orders are given and accepted it should be a recognized principle that they are not to be canceled or changed in their terms except by the consent of both parties. The binding obligation of a contract of this kind is conceded so far as the manufacturers are concerned, and a repudiation by a manufacturer of an order duly accepted is a practically unheard of thing and discountenanced by all the usages of the trade. It is, however, not an infrequent occurrence for buyers to regard their obligation with a discreditable laxity. Some merchants act as if the countermanding of an order were a privilege on which they might act at any time prior to shipment. They forget the inconvenience and injury often done to the seller by such unbusinesslike, if not dishonorable, action. A merchant in placing an order should recognize it as a serious legal contract by which both he and the seller of the goods are bound. If prior to its execution he desires to change the order or to countermand it in part or whole he should regard such modification or cancellation as something which may perhaps be conceded to him as a favor, but cannot be claimed by him as a right. By the disregard of this principle both manufacturers and jobbers are caused not a little inconvenience and loss.

A passing reference to the situation in Builders' Hardware in the report of the last meeting of the New England Hardware Dealers' Association, given in another column, is significant as indicating that the retail organizations of the country are beginning to take the matter up. Although little was accomplished except the formal bringing of the subject to the attention of the manufacturers in the special conference appointed for the purpose, it is hoped that the matter is not to be permitted to rest here. As a basis for future action it is important that the condition as relates to the interest of the retail trade should be clearly understood and the views of the retail merchants considered. It is on them as the legitimate distributers of the goods that the present state of things, with its complex competition and unprofitable prices, bears most onerously. This is a subject that deserves the best attention of the Hardware organizations in the different States. It may be that the retail merchants acting together will be able to bring the subject to the attention of the manufacturers and jobbers in such a way as to ameliorate, if not entirely rectify, existing conditions, and thus render a substantial service to all the great interests concerned.

Condition of Trade.

The past week has developed little change in the business situation. Prices remain very steady, with less than the usual revisions on the part of manufacturers. Manufacturers complain of the difficulty in getting raw material in certain lines, and the trade, on the other hand, are obliged to get along with a tardy execution of their orders for a few kinds of goods. There is perhaps a little let up in the demand made by the trade upon manufacturers, but the volume of business is excellent. There is relatively greater activity in the West than in the East. Reports of the general conditions of Southern trade are very favorable. Export trade continues large, but feels the effect of having prices higher on certain leading lines than are now prevailing abroad. Apart from the large foreign business in stable lines, there is a rapidly extending trade in specialties. Throughout the country Hardware merchants are gen-

erally doing a good business, and report pretty full employment of labor and an increase in building operations and other enterprises.

Chicago.

(By Telegraph.)

While every day brings nearer the expected summer lull in the Hardware trade no indication of it is yet visible. The volume of business keeps up to that of April's great record and may exceed it unless the latter half of the month shows a decided falling off. The flurry in the stock market last week had little or no effect on this branch of trade. Scarcity of certain classes of goods is as pronounced as ever. Jobbers in fact report that they are having more difficulty than before in securing Wire products, Sheet Metal goods and such articles as Mechanics' Tools. The great activity in the building trade has caused an extraordinary demand for Carpenters' Tools, and it is surprising to find the most staple articles in this line difficult to secure. Every day the city is being scoured by buyers endeavoring to pick up articles on which jobbers' stocks have run short. It is stated that large as the present volume of trade is running it could easily be made considerably greater if the goods could be secured. Prices under the circumstances are very firm, but no attempt is being made by those who are the fortunate possessors of desirable merchandise to take undue advantage of conditions. Prospects continue to be extremely encouraging. The Heavy Hardware jobbers are enjoying a trade equally as large comparatively as the Shelf Hardware jobbers. They report that May is likely to show a larger volume of business than April. The demand for Heavy Hardware comes from all classes of customers, including manufacturers who usually purchase direct from mills. The demand for more prompt shipment is urged and large buyers, who have mill contracts are being compelled to secure additional quantities from jobbers' stocks to be able to fill their pressing necessities.

Boston.

Bigelow & Dowse Company.—There is a marked contrast in the tone of the market this year as compared with 1900. The smash in the price of Wire and Wire Nails last year in April demoralized everything, and prices of all products of Steel and Iron commenced a decline that lasted throughout the year. This year prices are firm, and the trade have confidence that they will remain so. It is not believed that the large combination of manufacturers will again make the ruinous mistake of reducing prices in so rash a manner as before—if reductions must come it is hoped they will come gradually.

The complaints from all sides of inability to get raw material would indicate that declines are not in order at present.

The wholesale dealers have taken every precaution to have stocks on hand when the retailers asked for the goods, but there is a shortage already in many lines that will surely increase as the season advances.

Trade in New England is backward this spring, but everything is in full swing now. The packing floors are crowded with goods, and order clerks are working overtime. It seems that for the balance of the year sales should show a good increase over that of last. The rains in April stopped the usual large sale of Bicycles that month, and it should increase the sales for May, although some dealers feel that the buyers may have lost their enthusiasm and may defer buying. This feature remains to be proven. Everything now looks bright and prosperous.

Philadelphia.

Supplee Hardware Company.—In wholesale trade circles trade continues quite active, and embraces an extended line and variety of goods.

The entire country received a severe shock during last week, which, in certain conditions of the country might almost have produced a panic in trade circles, but it passed over without any apparent change in trade whatever. This shock, although caused in the effort to secure control of important railway interests of the country, did extend to all quotations and temporarily reduced the value of all kinds of stock listed upon the stock market. We think it is safe to say, however, that the average business man avoids speculative ventures of a nature which would practically overwhelm them financially if they were to indulge in stock gambling operations.

We think there are comparatively few in the legitimate retail Hardware trade who realize the present conditions of the Iron market, or of those goods that come nearest the base product. Orders for some certain goods used by the railroads are placed in enormous quantities never before known, orders have already been placed which cannot possibly be executed for the next three to four months; not only is the Pig Iron and Bessemer Steel market oversold, but material for the manufacture of leading goods of Hardware is largely oversold. In fact, if one could secure information and reach the bottom of the present conditions of the market they would be amazed at the large number of orders that are placed for certain kinds of goods by not only retailers, but large manufacturers who are buying months in advance of their actual anticipation of receiving their goods. Everything bids fair for a continuation of good trade for months to come.

Collections are fair.

St. Paul.

Farwell, Ozmun, Kirk & Co.—Trade during the first half of May has been heavy and has fully taxed the resources of the houses to get orders out promptly. Indeed, notwithstanding the very best efforts to prevent them, there have been too many delays in shipment, caused largely by the actual inability to get some lines of goods from the factories. This extends to a longer list of articles than is usually found, and has helped materially to increase the work of the order and the office force, as well as to hinder prompt shipments.

Jobbers have felt for months that this pressure was coming and have tried hard, though to some extent in vain, to prepare for it. It has simply been impossible to get certain lines of goods, and the probability is that there will still be a scarcity in them for some time to come. Fortunately this does not apply to a long list, but so far as it goes it is very annoying to both the wholesale and retail trade.

In other respects there is not a great deal to complain of. The volume of business is satisfactory and the prospects for the year continue good.

In prices there is but little of a character tending toward demoralization, while at the same time competition is very sharp and the percentage of profit is narrowed down to such extent as to render it quite too small when the labor and care, the expenses and risk of business are taken fully into account.

San Francisco.

Miller, Sloss & Scott.—At the present time and for the past few months the conditions on the Pacific Coast have been very good. The weather during this spring has been all that could be desired, and everything points to a prosperous season up to the present moment. The volume of trade has been a little larger than the previous year, and the only thing that now seems likely to disturb the existing condition of affairs on the coast is the trouble that is threatened by the labor strikes among all kinds of labor.

The advent of the President and his party on the coast, which will occur in a few days, will be a great occasion for the Pacific Slope, and preparations are now being made to receive the President in a manner which the people of the Pacific Coast hope he will never forget. It is very seldom that the people of this far Western slope have occasion to greet the President, and this occasion is taken to impress upon him the importance of our needs, with a hope that after he has thoroughly looked over the situation he may be of considerable help to us when he returns to Washington. The battle ship "Ohio," which is the largest one yet built by the Union Iron Works, is now waiting for the President to

push the button that will launch her on the seas, and we hope she will carry herself as well and make as good an impression as our President has.

Louisville.

W. B. BELKNAP & Co.—The market, on the whole, has maintained a satisfactorily healthy condition. Not being inflated, there is no apprehension of a serious collapse, as we have witnessed in financial circles the past week. People have not overbought and there has never been a more marked absence of speculative dealing than this season. There is a large, healthy consuming demand, which takes up the material as fast as it is made and wants a little more, but there is no apprehension of forced advances and, therefore, none about declines.

Of course if the demand should cease suddenly there might be some concessions made, but with the railroads doing such good business and crop prospects as fine as they are, we do not fear any widespread commercial collapse.

That such a disaster as the great fire at Jacksonville produced so little effect is an evidence of the strength of the country. Some years ago that would have reflected itself in business at once. Now it has simply called on the resources of the State and the nation and well disposed individuals to repair as best they can the loss gradually, and to infuse fresh courage into the people who have been so hard hit. It seems singular that two great Southern cities at opposite ends of the Gulf line—viz., Jacksonville and Galveston—should have been visited with such dire calamity within a year, one by water, one by fire. If these two elements could only have met in some middle ground, not so thickly populated by man, and had the contest out between themselves, we might have enjoyed the battle royal. As it is, it calls strongly upon our sympathies for the people in distress.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—April closed a very satisfactory month, and May, so far, is outdoing its predecessor. If we were in receipt of Galvanized Barb Wire, Black Sheets and Bolts, sales would make a still better showing than they do.

Government report of growing crops is of a tenor that leads us to expect a rattling fall business. Wheat is leaving warehouses in heavy volume, thus making way for the new crop. Two million bushels left out port, foreign bound, in April. Wool makes the poorest showing of any of our farm products, 75 per cent. of last year's clip being in warehouse, and the 1901 clip now pouring in.

President McKinley is due to arrive here in two weeks, and as wool is one of his pet hobbies we trust his coming will lift the price sufficient to let some of our growers out from under.

If present indications of bountiful harvest are realized, and fair prices prevail at harvest time, Oregon and Washington will be in the best condition financially they have ever been.

New Orleans.

A. BALDWIN & Co.—The volume of business during the past 30 days has considerably exceeded our expectations, as we usually look for a quiet month in April. Orders are not exceptionally large, but they keep arriving in such large numbers that in the aggregate they amount to a very large business.

A number of seasonable articles are becoming scarce, and the stocks of jobbers are very much broken on certain classes of goods that the manufacturers are unable to deliver promptly.

The month of May opened under very favorable conditions, and from present indications we believe the next 60 days will see the largest business that we have ever done in the South at this season of the year.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The wholesale business in this section of the country is rather quiet at present, but not more so than usual for this season of the year, as this is the dullest season in the Hardware business. The month of May will, no doubt, prove to be equally as good or better than any previous May. The jobbers generally are now hard at work on their inventory. The retail trade is unusually good. The prospects for a good business later on are excellent. The farmers are further advanced with their work than usual at this season of the year. The prospect for the wheat crop is good; in fact, all growing crops are in fine condition. Some corn had to be plowed up and replanted on account of cold weather. The prospects for a good fruit crop are excellent. Unless something unforeseen occurs the Hardware people will have all the business they can handle later on.

Baltimore.

CARLIN & FULTON.—In spite of the ups and downs of Wall street the legitimate business of the country continues to develop and prosper, offering an object lesson to investing capitalists in marked contrast with the uncertainty attending gambling in stocks and the unhappiness resulting from corners.

A wet and cold April has been succeeded by favorable weather, and every one engaged in outdoor occupations is busy, the farmer and the road builder, the stone mason and the bricklayer. The circus is again in evidence, and the baseball rooter is once more enthusiastic.

Were Barb Wire obtainable the volume of sales would be somewhat larger even though the profits would be but little increased; but for some reason best known to themselves the productive capacity of the factories has not kept pace with the extraordinary demand which they say exists this year. From a financial standpoint this would be no great regret, but the disappointment caused by inability to fill orders for this commodity is endless, and the only comfort we can gather is that the complaint is universal.

Chains have taken a big advance, the result of "community of interests," and we hear that there is perhaps a still further advance to occur a little later in the year. Possibly the manufacturers may desire the trade to consider the Trace Chain an article of luxury instead of necessity, and compel the farmer to hunt around for a substitute for the cheapest grade. In this State the Rope Trace in light sandy soil has been in use for many years, and perhaps its popularity may increase.

Early vegetables and fruit will soon put a great deal of money in circulation, and the farmer is building his hopes on his wheat crop, which promises well in this section of country.

NOTES ON PRICES.

Wire Nails.—Manufacturers of Wire Nails are making deliveries somewhat more promptly than for some time, but not as promptly as the trade could wish. The market is firm at former quotations, which are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.30
To jobbers in less than carload lots	2.35
To retailers in carload lots	2.40
To retailers in less than carload lots	2.50

New York.—Local business in Wire Nails is reported as having been lighter for the past week, but as still keeping up to good proportions. Quotations are as follows:

To retailers, carloads on dock	$2.53
Small lots at store	2.60

Chicago, by Telegraph.—Large specifications continue to be received by manufacturers. The consumption has not diminished, and present appearances indicate that a heavy Nail trade will be enjoyed up to July. Jobbers are having a very strong demand, but report not quite so much difficulty in securing a supply of Wire Nails as other Wire Goods. Carload lots are held at $2.45 and small lots at $2.55, with an occasional concession to $2.50 to the best traders.

Pittsburgh.—We note a continued heavy demand for Wire Nails, but the mills appear to be catching up with orders, and deliveries are more prompt than for some time. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....$2.30
To jobbers in less than carload lots..... 2.35
To retailers in carload lots..... 2.40
To retailers in less than carload lots..... 2.50

Cut Nails.—The demand for Cut Nails continues in good volume. There are reports of slight irregularities in quotations on carload lots of Nails. While the base price of $2 may be virtually maintained, it is intimated that in some cases there are concessions made by adding less than the proper freight to point of destination. While the differential between the price to jobbers and retailers in less than carload lots is nominally 15 cents, there is apparently no uniformity in the quotations of manufacturers on such lots to the retail trade. A differential of 10 cents between the price on carloads and less than carloads to retailers is frequently made. The market is represented by the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....$2.00
Less than carload lots.....$2.05 to $2.10

New York.—The local demand for Cut Nails is in about the usual proportion to Wire Nails. New York quotations for carload and less than carload lots are based on the above prices, to which Pittsburgh freight has been added:

Carload lots on dock.....$2.13
Less than carload lots on dock..... 2.18
From store 2.25

Chicago, by Telegraph.—A continued excellent demand for Cut Nails is reported by jobbers, who maintain the price of small lots from stock at $2.35.

Pittsburgh.—We note a good demand for Cut Nails, but the market is without special feature. We quote carload lots at $2, and less than carloads $2.05 to $2.10, f.o.b. Pittsburgh, terms 60 days, less 2 per cent. off for cash in 10 days.

Barb Wire.—The delay in the prompt execution of orders for Barb Wire on the part of manufacturers continues, but there is somewhat less complaint on this score. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....$2.60
To jobbers in carload lots, Galvanized..... 2.90
To jobbers in less than carload lots, Painted..... 2.65
To jobbers in less than carload lots, Galvanized.... 2.95
To retailers in carload lots, Painted..... 2.70
To retailers in carload lots, Galvanized..... 3.00
To retailers in less than carload lots, Painted..... 2.80
To retailers in less than carload lots, Galvanized... 3.10

Chicago, by Telegraph.—Manufacturers report new business not quite so large in volume. This is due to the falling off in the business of certain sections of the country. This particular locality shows no diminution in the demand. Jobbers are greatly surprised to find so late in the season the orders for Barb Wire continue to come in. The factories are still behind on deliveries, and great annoyance is experienced in endeavoring to secure even small lots to supply the pressing trade. Carload lots are held at $2.75 for Painted and $3.05 for Galvanized. Less than carloads are quoted at $2.85 and $3.15, respectively, with shading of 5 cents to best buyers.

Pittsburgh.—We note a continued heavy demand for Barb Wire, while specifications on contracts placed some time since are coming forward very freely. There is still some delay by the mills in making shipments. For domestic trade we quote: Galvanized Barb Wire, $2.90 in carload lots to jobbers, and Painted, $2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—The difficulty in getting prompt deliveries continues to be a feature of the Plain Wire market. The demand has been greater for this commodity than ever before. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots.....	$2.25	$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances.

Plain Fence Wire Advances (Catch Weights).

Nos.					Galvanized.
6 to 9.....	Base.....				$0.40 extra.
10.....	$0.05	advance	over	base.....	.40 "
11.....	.10	"	"	"	.40 "
12 and 12½.....	.15	"	"	"	.40 "
13.....	.25	"	"	"	.40 "
14.....	.35	"	"	"	.40 "
15.....	.45	"	"	"	.75 "
16.....	.55	"	"	"	.75 "
17.....	.70	"	"	"	1.00 "
18.....	.85	"	"	"	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—The Plain Wire situation shows no improvement in deliveries. Manufacturers continue badly in arrears in making deliveries. A very heavy business is being done in Woven Fencing. This is using up a much larger quantity of Smooth Wire than usual. Manufacturers of Woven Fencing are 60 days behind on shipments, and are now receiving numerous orders for fall delivery from jobbers who are taking steps to protect that season's trade. The largest manufacturers of Woven Fencing are increasing their capacity by securing additional machines, hoping to put themselves in a position to meet their customers' requirements. Carload lots are still held at $2.40, base, and small lots from stock at $2.50, with an occasional shade to $2.45.

Pittsburgh.—The capacity of the mills rolling Plain Wire is taxed to the utmost to catch up with the demand. Prices are firm, and for domestic trade we quote:

	Plain.
To jobbers in carload lots.....	$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Cordage.—Demand for Rope lacks the activity that manufacturers desire. This condition has prevailed to a greater or less extent for the past two or three weeks, and is beginning to affect prices, particularly those of Sisal Rope. While no announcement has been made of a change in quotations, Sisal Rope can be purchased at from 7¼ to 7½ cents per pound, according to quantity. This is in the face of a stronger fiber market, and seems to be caused by the desire of manufacturers to sell their product. Manila Rope is quoted at 10¼ to 10½ cents per pound according to quantity.

Binder Twine.—As harvest approaches the demand for Binder Twine shows some increase. The quotations given below represent the Eastern market generally, though one quotation of 7½ cents for a carload of Sisal Twine, for June delivery and prompt acceptance, was reported this week. General quotations, with a rebate of ¼ cent in carload lots, f.o.b. Eastern factories, are as follows:

White Sisal, 500 feet per pound.....8¼c.
Standard, 500 feet per pound.....8¼c.
Manila, 600 feet per pound.....10 to 10¼c.
Pure Manila, 650 feet per pound.....11¼c.

Glass.—New prices went into effect on May 11, the discounts off of the jobbers' list now being as follows:

	Discount.
Less than car lots.....	80 and 20 %
Carloads	85 and 5 %
3000 boxes.....	87 %

These prices are for single or double strength, and cover the entire country. The majority of the Glass factories closed on May 11 for the summer, and it is expected that all others will close before the end of June. The amount of Glass made from the present time until all the factories close will not have much effect upon the available market supplies. The wage scale for the ensuing fire has not been settled yet. Locally trade is quiet, and the knowledge of an advance to be made on May 11 did not stimulate buying.

Paints and Colors.—*Leads.*—There is a lack of new business in White Lead in Oil, deliveries being largely on contracts. The absence of active demand is accompanied by irregularties in price, concessions being made by some grinders, while others adhere to former quotations of 6½ cents in lots of 500 pounds and over, and 7 cents in less than 500-pound lots.

Oils.—*Linseed Oil.*—There is a steady demand for Linseed Oil in small lots, with an occasional carload, but no desire is shown to anticipate wants or indulge in speculative buying. Large buyers have so often lost money on manipulated markets that the prophecy of 60 to 65 cent Oil in the near future offers no inducement to purchase. One concern continue to quote on the basis of 59 cents for out of town brands, but are supplying lots of five barrels to a carload at this figure. Other crushers are holding to 60 cents, and show no anxiety to sell. The market is firm on City Oil at former prices. Quotations are as follows: City Raw, 61 to 62 cents, according to quantity. Out of town Raw, 59 to 60 cents per gallon. Boiled Oil is 2 cents per gallon advance on Raw.

Spirits Turpentine.—The demand for Turpentine is, to a large extent, confined to the painting trade, whose requirements are reported to have been fairly good. The market has dropped off a cent during the week, present local quotations being as follows, according to quantity: Southerns, 34 to 34½ cents per gallon; machine made barrels, 34½ to 35 cents per gallon.

EVOLUTION IN BUSINESS.

THE following abstract of an address made by J. D. Cox of the Cleveland Twist Drill Company, Cleveland, Ohio, before the Cleveland Chamber of Commerce, is a condensed and suggestive statement of the operations of the laws of trade whch have been influential in producing some of the remarkable changes which have taken place in the commercial world:

Perhaps the most remarkable change that has taken place in the business world during the last ten years is the advent of the so-called Trust. In my judgment the trusts are the result of forces that have been silently at work ever since the building of railroads and telegraph lines destroyed the isolation of the manufacturer and brought all parts of the country into direct competition with him.

The old saying that "competition is the life of trade" depends entirely on your point of view. It is like the boy throwing stones at the frogs—fun for the boy, but death to the frogs; so competition is fun for the buyer, but death to the producer or seller.

In the olden days the country merchant went to town to buy his season's goods. The city jobber sought out the manufacturer to place his orders. The buyer was personally acquainted with the seller—he knew him and had confidence in his integrity. When the seller told him that the price named was the lowest he believed him and knew that no other buyer could get a lower one.

With the advent of railroads, steamboats, the telegraph, typewriters, &c., came the development of new centers of trade and manufacture. New York and Boston ceased to supply the whole country and manufacturing was no longer confined to New England.

Buffalo, Cleveland, Pittsburgh, Chicago, St. Louis, Kansas City and San Francisco became great distributing and manufacturing centers. The manufacturer could not visit his trade any longer and look after his factory, too, so the traveling man was sent out to sell the goods. The merchant or jobber could no longer attend to all the details of his business, and the purchasing agent or buyer was introduced. The manufacturer and merchant from this time on were no longer in touch with each other.

The salesman reduced selling to a fine art, but the buyer went him one better, resorting to all sorts of tricks and dodges to beat down the seller's price. Manufacturers were pumped so full of stories given to their salesmen by the educated buyers that they grew to believe their competitors were rascals of the first water.

This state of things gradually reduced the manufacturers to a point where there was no living to be had in their business.

Meetings of competing manufacturers resulted in Gentlemen's Agreements as to prices, which continued until some manufacturer took advantage of the situation to increase his own business at the expense of his associates. Then they separated, to suffer as before, till none could stand it longer, when fresh meetings resulted in some form of pooling arrangement. Jealousies crept in and after a time the pools were broken up.

There was but one thing more that could save them, and that was the joint ownership of all the plants by a stock corporation, and the Trust (so called) followed as night the day.

Hardware Organizations.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

The New England Hardware Dealers' Association met for their regular monthly dinner and business meeting at the United States Hotel, Boston, May 8. Following the dinner a report of the committee recently appointed to devise a plan to adjust the differences between the manufacturers of Builders' Hardware and the retail dealers was received. The grievance referred to is the selling by manufacturers direct to contractors and builders, which, it is claimed, has in some cases been done at a price lower than is given to the dealer for stock goods. The committee consisting of J. B. Hunter, chairman; D. Fletcher Barber, Edward A. Loomis and Samuel H. Thompson met the manufacturers at a meeting recently held at the Hardware Club in New York. This conference, however, apparently resulted in nothing definite, but it was decided to continue the committee and accept their report as one of progress.

On motion of S. D. Balkam an amendment to the by-laws was adopted, permitting the Executive Committee to fill vacancies that might occur in any committee.

Anthony S. Morss moved that the June meeting of the association be omitted, and that a January meeting be added, which was carried.

M. A. Chandler of the firm of Chandler & Barber was elected as a representative of the association in the State Board of Trade for three years to succeed Hiram G. Janvrin, resigned.

ARKANSAS RETAIL HARDWARE DEALERS' ASSOCIATION.

In announcing the second annual meeting of the Arkansas Retail Hardware Dealers' Association, J. A. Plummer, Marianna, secretary of the association, has sent the following circular to Hardware merchants throughout the State:

The second annual meeting of the Arkansas Retail Hardware Dealers' Association will be held in the hospitable city of Hot Springs, Ark., on June 19 and 20 next. I have mailed you a copy of the proceedings of the first meeting, also a programme of the meeting to be held as above.

To accomplish the desired ends of this association it needs you and for your protection you need it. Among many other good and sufficient reasons for joining us, I call your attention to the following five urgent ones why you should do so:

1. If the Range peddlers have ever sold goods to your customers.
2. If you want the co-operation of every Hardware dealer in the State against catalogue houses and others of the same class.
3. If you wish to prevent the large jobbing houses of the country from selling Hardware to racket stores, department stores and grocery stores.
4. If you want to avoid the cutthroat competition from your neighboring Hardware store.
5. If you want to keep abreast of the times and get the wideawake ideas of the other dealers of the State.

I deem these reasons alone sufficient to induce you to send in your application for membership and cause you to meet with us in Hot Springs on the dates mentioned. You well know the proverbial hospitality of this City of Vapors, and knowing it you cannot doubt but that the meeting will be well worth attending.

From the programme of the meeting we note that the following papers are to be presented:

"The Steps Necessary to Make a Success of the Hardware Business," by E. E. Mitchell.

"Does it Pay to Handle Cheap Goods?" by F. C. Stearns.

"How to Treat Your Competitor," by W. F. Babcock.

"Should Goods be Marked in Characters or Plain Figures?" by E. W. Horne.

"Should the Members of this Association Support the Jobbers Who Sell the General Trade?" by W. M. Harrell.

"The Relation that Should Exist Between the Jobber and Retail Merchant," by D. H. Miller.

These will be recognized as timely subjects, and with the general discussions which follow should in themselves repay merchants for the time and expense involved in attending the meeting. The Question Box will also be a feature of the proceedings of the convention, which should prove an interesting and instructive gathering of the Arkansas trade.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION.

As previously noted in our columns, the eleventh annual convention of the Southern Hardware Jobbers' Association will be held in Asheville, N. C., on June 4, 5, 6 and 7, 1901. A cordial invitation is extended by the officers and members of the association to manufacturers and their representatives throughout the country, and also to Hardware jobbers, regardless of their location or connection with the association. On account of the many attractions in and around Asheville, and the delight with which the gentler sex look forward to the visit to that inviting spot, the officers of the association are making special efforts to induce the gentlemen attending the convention to bring their families with them, and we are advised that a very large number of ladies will accompany the delegates to the convention.

We are requested to state that the manufacturers and outside jobbers who attend the convention are not expected to extend any courtesies or entertainments for the benefit of the members of the association, nor will the members of the association go to any extra trouble or expense by reason of the manufacturers and others being in attendance at the meeting. All are invited to the convention solely for the purpose of promoting more intimate social relations, consequently more friendly feeling. All visitors will be cordially received by the members of the association, and will be welcome to take part in the conferences and deliberations at all sessions except those which are of an executive character.

The morning sessions on the 4th and 5th will be devoted to joint sessions of the jobbers and manufacturers and their representatives, and will be open as well to any visitors who may care to listen or take part in the proceedings. A new departure has been made this year by continuing the convention through four days instead of three, as heretofore. No business sessions will be held in the afternoons or evenings of the 5th, 6th and 7th, which will permit of more entertainments and leisure than has been the case in previous years. A number of timely and interesting subjects to the trade will be taken up for discussion, and the meeting promises to be an unusually interesting one.

We are advised by the secretary-treasurer that the indications point to a large attendance of members, and also of manufacturers and their representatives. As in previous years, a Reception Committee, composed of the manufacturers' Southern representatives, has been appointed, consisting of some 50 of the most prominent Southern traveling salesmen representing the manufacturing interests of the country.

The Battery Park Hotel has been selected as official headquarters, and special rates will be granted those in attendance at the meeting. The passenger associations of the various railroads have also given the Southern Association reduced rates upon the customary certificate plan reduction. To those who contemplate attending the convention and who desire any special information, both as to hotel and railroad rates, full particulars can be secured by addressing C. B. Carter, secretary-treasurer, Knoxville, Tenn.

THE TESTING OF FIRE ARMS.

THE high quality of the products of leading manufacturers of Fire Arms is unquestioned, but every year there are many accidents from the use of inferior Guns and Pistols, a matter which is referred to in the following communication, which relates to the desirability of requiring some official tests of Fire Arms:

There is no regulation in this country as to Guns being proved, and thousands of cheap Revolvers and cheap Rifles and Shot Guns are put on the American market every year by American manufacturers which are never fired before they are sold. It is, in our opinion, a deplorable and dangerous practice, which should not be allowed to continue. It exposes to accident many innocent purchasers, and there are no doubt hundreds, and perhaps thousands, of people injured every year by American arms which are made of cheap material, and have never been proved or even fired with the standard loads. There is no question in our mind but that the percentage of accidents will so greatly increase that sooner or later either the State governments or the National Government will be compelled to take some action, requiring either that American arms be proved in proof houses established under Government supervision or, better, that all arms be proved by inspectors appointed by the Government and working under standard conditions and using standard proof loads which shall be designated by the Government.

If this latter condition could be brought about so that the proving could be conducted in the manufacturing plants themselves it would probably be the most convenient way for the factories. We have often felt that under proper conditions such action would be a great help to the manufacturers, as it would release them from further responsibility after the arms had once been properly proved and indorsed by the Government stamp. If, after that, a Fire Arm was wrecked there would be no question but that it had been submitted to a greater pressure than it should have been, and there would be no possibility of throwing any doubt onto the manufacturer of the arm or making any claim as to an imperfection in the arm.

In the meantime the only thing for users of arms to do is to confine their purchases to products of factories of well-known responsibility, who have reputations too great to be sacrificed by any negligence or omission of any possible precaution in the way of safety.

CANADIAN PAINT REGULATIONS.

A DECISION of considerable interest to both American Paint manufacturers and Canadian Hardwaremen was recently made at Ottawa, Canada. Samples of Paint manufactured by the Wadsworth-Howland Company of Chicago were seized in Rice, Lewis & Son's store in Toronto on April 24 by an officer of the Canadian Weights and Measures Department on the ground that they did not comply with the regulations in force in Canada. W. A. Campbell, representing the Wadsworth-Howland Company, at once repaired to Ottawa, where he presented the facts to the Minister of Inland Revenue having jurisdiction over these matters. It appears that the Canadian regulations provide that Paints sold by measure must be put up according to Imperial standard, while the company's Paints are put up according to United States measure, which takes a less quantity. But it was shown that the Paint was being sold at a price per package and not by measure, and consequently the Canadian regulations were not infringed. Some $20,000 worth of Paints were liable to seizure in this one establishment if the regulations had actually been violated.

THE IRON CLAD MFG. COMPANY, whose main offices and works are at New York, have opened a branch office and salesroom at 233 Lake street, Chicago, with E. E. Aube in charge.

Notes on Foreign Trade

BRITISH LETTER.

FROM OUR SPECIAL REPRESENTATIVE.

HASTINGS HOUSE, NORFOLK ST., LONDON, W.C.

Ironmongers in Conference.

THE recent ironmongers' conference in Birmingham is significant. Although only a small proportion of the British Hardware trade is organized, yet the movement is spreading, and small though it is at present, its influence is being felt. A notable feature of the conference was the dinner at which the delegates were entertained by the Birmingham and Midland factors. Both factor and retailer are, in their several ways, feeling the stress of present trade conditions, and there is a notable desire among both sections of the trade to work amicably together. Two or three important points are worth the attention of American exporters. The price maintenance scheme has proved to be popular, both among the wholesalers and the retailers; and it is felt that before long the principle can be applied to articles other than those which are strictly proprietary. The idea is for the owner of a proprietary article to stipulate on his invoice that the goods shall only be sold over the counter at a minimum price. Last week I was conducting an American visitor over a magnificent showroom in Cheapside. He instantly remarked the high price obtained for a certain well-known American article. His surprise was marked when he was told by the salesman that they were not allowed to sell at a less price by the terms of the sale. Although it is obvious that many of the staple lines can never be worked in this way, yet there are a large number of goods needlessly undercut and whose selling price might advantageously be levered up if the wholesalers concerned could agree among themselves. Legally the position is impregnable. If a wholesaler or a manufacturer stipulates upon his invoice form that the goods shall not be sold at retail at a less price than the stipulated minimum the retailer is legally compelled to abide by it. I think that several lines exported by Americans might be more remuneratively sold if this policy were only adequately grasped by them. There has been a distinct tendency during the past 12 months on the part of American exporters to get better prices for their goods, apart altogether from the marked increase in value. The reason for this is that many American agents have discovered that by selling their goods too cheaply they are not sufficiently appreciated. The retail trade is equally pleased to get a better price, and so everybody is satisfied. Thus it is that wherever two or three ironmongers or wholesale Hardwaremen are gathered together they invariably speak favorably of the price maintenance scheme.

Direct Trade.

Another point which at the present time is exercising the minds of many retail ironmongers is the tendency among certain manufacturers to go direct to the consumer. This has been particularly the case with Gas Stoves. An American Gas Stove manufacturer who called upon me recently was just in time to get my advice on this point. I said to him, you must either sell to the municipal corporations and the large gas companies and ignore the retailer, or you must put upon the market such a cheap Gas Stove as will attract buyers. Most of the Gas Stoves in use are rented, and not bought; but I have no doubt that many a *paterfamilias* would buy a Gas Stove if he could get it somewhere about $20 or $25. That is by the way. The ironmongers in conference assembled are showing that they will not have any dealings with manufacturers or merchants who go direct to the consumer. Last year a great deal of friction existed between the retail trade and the Lawn Mower manufacturers. Since the Ironmongers' Federated Association has come into prominence the Lawn Mower manufacturers have made an agreement with the retail trade, whereby the trade is secured to the retailers and a fixed profit secured. I think that several American Mowers might be slightly advanced in price without loss of trade in consequence of this agreement. Some of the American Lawn Mowers that one sees in stock are being sold so cheaply that the buyer is instantly suspicious of being fobbed off with rubbish. The Englishman wants to buy a Lawn Mower which will last him several years. He has no idea of buying it only for one season. But the point is that whether it be Lawn Mowers or anything else, it is better to cultivate the retail trade. This should be done by consulting the retailer. For example, advertising in magazines and similar periodicals may be a good thing, but it is very much better if buyers are invited to purchase through the local ironmonger. Again, prices should not be advertised, as that leads to considerable misunderstanding. If you have an American article which you desire to advertise in current literature emphasize its special qualities and characteristics by all means, but leave the price alone and encourage the local retailer. However, American firms are not markedly sinners in this respect, but it is necessary to take notice of the growth of the association movement, particularly as it affects the wholesale trade.

Municipal Trading.

Another point upon which the retail trade is emphatic is its determination to curtail as far as possible the movement toward municipal trading. Municipalities are now cutting into the British Hardware retail trade to a considerable extent. I have already mentioned the case of Gas Stoves; I might add Gas Fittings, Electrical Fittings and Plumbers' Goods. British municipalities are strongly tempted to encroach more and more upon the retail business. Not only is the Hardware trade threatened in many particulars, but other trades also. It was points like these that created so much interest at the Ironmongers' Federated Association conference. The points considered and the temper of the delegates should not be overlooked by any American who comes to this country seeking to do business with the British Hardware retail trade.

The Prospect in South Africa.

It is exceedingly difficult accurately to gauge the business prospects in South Africa. The disposition among business men at the moment is to leave South Africa severely alone. The chief difficulty seems to be a want of reliable information. As nearly as one can judge, the war has settled nothing, and beyond holding the lines of communication and some of the towns, the British are not in effective occupation in either the Transvaal or the Orange State. It is the uncertainty which affects business men. It would be better if they knew either the best or the worst. As it is, the import and export trade of South Africa shows an appalling shrinkage. Some little business is, of course, being done; $750,000 worth of metals and metal manufactures imported into the Cape in January last, $450,000 worth of leather, saddlery and harness, $450,000 worth of wood and furniture show the extent of the Hardware and allied trades just now. There is a feeling among business men that the situation cannot continue as it is much longer. Either there must be a surrender on the part of the Boers, or the British must recede a little from their claims, and aim only at a protectorate instead of a new colony.

Following the American.

Some years ago, when first American manufacturers of Agricultural Implements were exhibiting in this country, an American and a British manufacturer were comparing notes. "You are making your implements too light for this market," the British maker said. "My implements are strong enough for prairie lands," was the response of the American. This British manufacturer, who has recently been in America, is now taking out the whole of the present system of driving and putting in a complete system of electric transmission, with the most economical form of generating plant, and motors on the continuous current system. Upon this new basis he is remodeling the whole of the works.

Iron Tanks Wanted.

Midland manufacturers here had their attention drawn to an opinion expressed by the Government astronomer of Sydney University. He recommends iron tanks for the storage of water in Australia. He says that evaporation carefully measured in the Western districts of New South Wales is from 5 to 6 feet per annum, according to the season. Tanks, therefore, should be made small in diameter and as deep as possible. They should be completely covered after the old Arab fashion, which prevents the wind from getting at the water.

A Market for Cheap Cutlery.

A few years ago it was generally recognized that Germany could beat the world in cheap Cutlery. It is not so to-day. The Solingen manufacturers are now devoting themselves successfully to the better grades, and I dare say that Sheffield now makes both the dearest and cheapest Cutlery on the market. I have seen some remarkably cheap American lines in Cutlery in other countries. I sometimes wonder why we do not see them in Great Britain, particularly in Ireland, where American goods are popular. Sheffield is a hard place "to buck against," but Sheffielders are not keen about selling inferior grades. The local tradition is dead against it. Yet there is a demand for cheap Cutlery.

Fruit Cutlery.

I was surprised to hear from a friend the other day, on his return from New York, that he had bought a considerable parcel of American Plated Ware. He says it is the best in the world. I chaffed him, remarking that it came from Rodgers of Sheffield. He said he saw it in the making and meant to cultivate that particular line of goods. He may be right. England is fast becoming a fruit eating community, while vegetarianism (partial or whole) shows a marked increase in popularity. This results in a lessened demand for Steel Table Cutlery and a sharper demand for plated or similar goods.

HARDWARE STORES IN JAPAN.

FROM OUR SPECIAL CORRESPONDENT.

Concluding Article.

Farming Tools.

THERE have been some notable changes in farming methods here during the past two or three years. Old residents inform me that for generations the only farming tools possessed by the native farmers were crude hand devices. Recently imported Shovels, Pick Axes and kindred tools have been introduced and the demand is increasing. The prices obtained are very good indeed, and many a Japanese importer of Farming Tools has made a fortune. One foreigner who fostered this trade told me he had come to Japan to see some of the Japanese importers who had been buying so largely from his house, as he desired to establish an agency for the sale of his goods. I met a number of foreigners who have received rich returns from Farming Tools supplied to the Japanese. The demand for Shovels is exceedingly good and double prices can be obtained for these goods.

A Short Sighted Policy.—I saw in some of the Hardware stores great lots of Shovels imported from a foreign country, and upon examination found them to be very defective. I could bend the blades double with slight pressure. The metal portion was so poorly attached to the handle that it could be wrenched off by hand. These Shovels were plainly made for export and sale to a foreign buyer in the hope that they would be worked off and the defects not noticed. But the Japanese buyers were not to be caught, and they refused to pay for the goods. Practices of this sort cannot be made to go through.

Pick Axes and Rakes.—Pick Axes of American pattern are in demand. The Japanese are making an imitation Pick Axe which they intend to put upon the market, and in fact have already done so. There is but one point to it, and the tool is clumsy to handle. Rakes are also wanted, and even these have been imitated by the tool makers of the Empire, but with poor success. The Rakes I saw would amuse American Rake manufacturers. Usually a flat piece of iron is used and bored at intervals for the insertion of the teeth. The whole thing is awkward and stands no comparison with the genuine American Rake.

Lawn Mowers and Garden Tools.—There is quite a good call for Garden Tools, such as Lawn Mowers. I saw some Lawn Mowers on sale and marked at very high prices. Upon inquiry, I was told that the values were set high because of the short supply of such machines in the country and it was known that good prices could be obtained for the asking.

Bicycles and Motor Carriages.

Many of the Hardware stores here are doing a very good business in Bicycles and some have gone so far as to put in motor carriages. There is a lively request for Bicycles here and the Hardware people are making money out of it. I noticed that some of the Hardware stores had put in Bicycle repair shops and in a few cases I saw American machinists employed at repairing and constructing wheels. These machinists informed me that they received from $2 to $2.50 per day. One American machinist had charge of a shop in the rear of a Hardware store in which several Japanese machinists were employed as repair men at 40 cents per day. This is a high rate of wages, but the Bicycle repair business is a paying one here, and all concerned in it earn good livelihoods. The Bicycles of all makes and of nearly all countries may be seen on sale here. The Hardware people are visited at frequent intervals by agents of foreign Bicycle makers, and the stock of Wheels is seldom depleted. There is a goodly proportion of American Wheels in the stores, and the demand for this type of Wheel is as good as for any other. The American Wheel is noted for its good finish and strength as compared with some of the makes from other countries.

Paints, Colors and Varnishes.

All of the Hardware stores of this country carry a line of Paints, Colors and Varnishes. In former times it was the custom to do considerable staining of woods for house building purposes and the demand for oil colors was not so great. But in recent years oil Paints have been introduced, and Leads of all kinds may be found on sale in the Hardware stores. Usually the Paint department is separated by walls and different clerks are employed. There is a distinct division of bookkeeping for the sales made from this room. In fact it is a Paint store within a Hardware store. The prices secured for Paints and Colors are good as compared with the average prices of imported articles. All sales are for cash, and the dealer relies upon quick sales, but not always small profits.

Carriage Hardware.

I am informed that the call for Carriage Hardware has vastly increased during the past few months. There are now carriage and wagon builders in Nagasaki and other places who are making vehicles according to American and English ideas. The long shafted, two-wheel cart of the Japanese is being dispensed with for the four-wheeled vehicles. There have been carriage repair and building shops opened in all directions recently and the demand for materials for use in the manufacture of modern vehicles is considerable. Carriage Springs are in lively request and the prices run very high. There are some metal works here that make Carriage Springs, but I examined the Springs and readily discovered their inferiority as compared with the imported types. Some of the Springs were shown me which had been used, and they were sprung out of form and imperfect in several ways.

Oils.

The Hardware stores also carry stocks of lubricating Oils, and the call for these is good. There are numerous power works established throughout the country in which there are engines requiring the use of cylinder Oils of all kinds. The hard greases for lubrication are also wanted for the chains of conveying machinery in the mines and other places. Double and even triple values are frequently paid for Oils and Greases by the

consumers. The Japanese manufacture Oils of several sorts, one kind being made from the seed of the sunflower. They also make lubricating Oils from the fat of animals, from cocoanut copra shipped here from the Philippines, and from other sources, all of which Oils are carried in stock by the Hardware people.

Good Opening for Americans.

Taking all matters into consideration, I am of the opinion that there is a very good chance in Nagasaki and other leading cities and towns of the Japanese Empire for the starting of American Hardware stores. There should be good stocks put in and the stores furnished as in America. The taxation upon the Hardware business is very low, and the duties upon imported Hardware not unreasonable. The prices obtained for American goods assure rich profits and the sales are good. Hardly any stores carrying Hardware are overstocked with American goods.

MEDITERRANEAN AND ORIENTAL DEPARTMENT OF STRONG & TROWBRIDGE COMPANY.

Strong & Trowbridge Company, 21-24 State street, New York, exporters of American products to South Africa, Australasia, China, Japan and other Oriental markets, have further enlarged their sphere by absorbing the business formerly conducted by W. S. Bigelow & Co., 116 Broad street, New York. The partners in the latter firm, Walter S. Bigelow and Benjamin O. Hough, will be in immediate charge of this part of the Strong & Trowbridge Company's business, which will be known as the Mediterranean and Oriental department. Mr. Bigelow will supervise the details at this end, and Mr. Hough, who has made a number of trips around the world selling American goods, will soon start on a similar mission, visiting sections in which the house of W. S. Bigelow & Co. had already established good connections. The territory he will cover includes the Levant or Eastern Mediterranean countries, among which are Greece, Turkey, the Balkan States—*i. e.*, Bulgaria, Roumania and Servia, Asia Minor, Syria and Egypt. The trip will be extended to Red Sea points, Persia, a portion of Abyssinian Northeast Africa known as the Somali Coast, opposite Aden, and India. There is much good trade in these countries, but it requires a careful scrutiny of credits and conservatism in selling to yield a profit, a fact that puts the manufacturer at a disadvantage in direct dealings, unless the volume of business warrants trips of personal representatives and facilities for keeping in constant close touch with merchants. With these new arrangements the Strong & Trowbridge Company are regarded as in an especially favorable position to increase the sale of American products in the territory covered by their Mediterranean and Oriental department.

UNION METALLIC CARTRIDGE COMPANY'S NEW PRICE-LIST.

THE UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn., and 313-315 Broadway, New York, have just issued an illustrated catalogue of Shot Gun Shells (loaded and empty), Wads and Primers. This book describes in detail the changes in color and names of Shells for Shot Guns, as referred to in *The Iron Age*, April 18, the object of the new arrangement being to protect the reputation of U. M. C. Factory Loaded Shells against inferior loading of their make of Shells by others. While in effect the same Shells are used by them and the public, empty Shells cannot be bought by outsiders under the same name or color as those loaded at their factory, so that from the mere outward appearance of the Shell it can be determined whether it was loaded by the Union Metallic Cartridge Company or others.

THE trade will observe among the Special Notices in this issue one signed George M. Hine, trustee, in which the sale of a stock of Hardware in Poughkeepsie is announced to take place May 20. The store fixtures, as well as an assorted stock of Hardware, are thus to be disposed of.

TRADE ITEMS.

T. J. McKELL, Portland, Ore., has associated himself with James Heatley, formerly proprietor of the Heatley Mercantile Company, Weiser, Idaho, and will do business as manufacturers' agents at 206 Stark street, Portland, under the style of McKell & Heatley. The new firm will work Idaho, Oregon and Washington, and their trade will be almost exclusively with the jobber, selling the retailers only on specialty goods, which they are introducing.

HOOPER, SEVING & CO., 428 Market street, Philadelphia, have been appointed selling agents of the Mt. Vernon-Woodberry Duck Company, and will carry for them a full line of stock of all the Twines, Ropes, Yarns and Wicks which they manufacture. All inquiries that formerly went to Wm. E. Hooper & Sons, 246 Market street, will receive prompt attention from them. They also manufacture and handle a full line of Flax, Jute and Hemp Twines and Ropes.

THE HINE-WATT MFG. COMPANY, manufacturers of the Columbia Automatic Gas Lamps and Builders' Hardware, and who operated a foundry at 14 and 16 North Canal street, Chicago, have sold their foundry and Hardware business to N. F. Purcell & Co., 232 South Clinton street, Chicago. The Hine-Watt Mfg. Company will go exclusively into the manufacture of their Gas Lamps and Metal Specialties, and have opened downtown offices in the Fairbanks Building.

THE Lock manufacturing business in Brooklyn, N. Y., formerly carried on by Wilson Bohannon and for the past five years by the estate of Wilson Bohannon, has been incorporated under the laws of the State of New York as Wilson Bohannon, the capital stock being $40,000. The stockholders of the corporation consist of the heirs of Wilson Bohannon, so that the management and financial interests remain unchanged. W. T. Bohannon is president of the corporation and Edwin L. Gwathmey, secretary and treasurer.

R. R. MABIE, 154 Chambers street, New York, has recently established himself in business at the above address on his own account, he having been formerly the New York agent of the Warren-Ehret Company, who were consolidated with the Barrett Mfg. Company, at the time the Coal Tar Trust was formed, and continuing with them until engaging in business with independent manufacturers. Mr. Mabie has the street floor and basement, 90 x 25 feet, in which he carries a stock of Building Papers, Coal Tar Products and Tarred Roofing Materials.

ONE of the members of the firm of F. E. Myers & Bro., Ashland, Ohio, who manufacture various forms of Pumps, including Well, Tank, Spray and Wind Mill Pumps, has just received a patent for what is called the Upright Bulldozer Power Pump Working Head. This device will be manufactured and put on the market by F. E. Myers & Bro., who consider it one of the most important devices in its line that has been brought out for some time, meeting a requirement for a Power Working Head to cover a wide range of conditions.

THE CLEVELAND TWIST DRILL COMPANY, formerly at 99 Reade street, New York, in charge of Clarence I. Markham, have removed to No. 62 in the same street, within half a block of Broadway. The growth of the business here has compelled them to secure larger quarters, they now having the street floor and two basements, each about 60 x 30 feet. This company, established in 1874, manufacture large assortments of all kinds of Drills, Bits, Reamers, Mills and Milling Cutters, Taps, Sockets, Drill Holders, Countersinks and similar goods.

Chas. Chamberlain has disposed of his Hardware business in San Angelo, Tex., to C. & G. Haglestein Company. Mr. Chamberlain is now manager of the San Angelo Windmill Supply Company, jobbers and retailers of Wind Mills and Well Supplies, who have lately commenced business.

SHOW WINDOW DISPLAY.

This Department is to give information in regard to the use which may advantageously be made of show windows of Hardware stores, with practical suggestions in regard to the arrangement and display of goods and other methods of attracting business.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

SHOULD DISPLAYS BE MIXED?

Is it better to display one line or several in the show windows? This question was addressed to leading merchants in different sections, and the replies received indicate very clearly that the large majority of dealers believe in showing either one line, or related lines of goods most of the time. Some merchants believe in mixing lines in a window, but these are in the minority. The opinions of the 82 dealers heard from have been classified as follows:

Display one line only	45
Generally display one	21
Sometimes display one line and sometimes mixed lines	7
Display mixed lines	9

Many of these merchants have given valuable opinions and suggestions on the subject, some of which are quoted below, believing that they may be of interest to the trade.

One Line, Says a Progressive New Jersey Merchant:

Our practice is never to put more than one line of goods in a window, or rather compartment of a window. If you can fill a single window with one article it makes a very effective advertisement. For example, we have just had a window full of nothing but Crown soap, and while that is an article little used by any but high class stable trade, it causes at the same time a great many inquiries as to what it is for, and so forth; and even brings people in just from curiosity. In general kindred lines, such as Tools, Paints, Toilet Paper, Welsbach Lights, Cutlery and such goods, will all attract more attention if a window is reserved to each separately. Such a window will certainly be more likely to attract a customer's attention to an article he may see, if he only has to pick it out of a few articles, than if he had to pick it out of a man's entire stock, sampled in the window, as is too often the case.

Practice of a Large Kentucky Dealer:

"Is it better to display one line of goods or several?" This depends entirely upon the season of the year. I believe if the windows are small it is best to use one article, if it is a seasonable article that you wish to display, otherwise I should never confine myself to one article, but use as many seasonable goods as possible in the window. One article attracts one person, and is of no attraction whatever to another. Place as many articles in a window display as possible, and arrange them in such a manner that it will be certain to stop your customer. If you cannot attract him in one way do so in another. A very good method to attract attention is to lay a very bright Tool in the sunlight at such an angle as to throw a ray of light into your customer's eye. He will stop every time and see what article it is that has caused the trouble. This makes a very good ad.

"Oneness" Advocated by Progressive Iowa Merchant:

I am a strong advocate of the idea of "oneness" in the display of goods. *One* kind of article, or *one* kind of goods, or several different kinds of articles advertised at *one price*, I believe attracts attention and allows the observer to take in at a glance and retain the display in the mind, where a display of several articles of a miscellaneous character would only be confusing. For example: A display of Tea Kettles of one kind or of different kinds would make an impression on the mind of even the casual observer, and he would no doubt be able to tell his wife after he went home what Mr. Hardwareman has in his window this week, while if the display was a miscellaneous collection of Tea Kettles, Boilers, Dish Pans, Axes, Churns, Curry Combs, &c., the chances are he would not tell a single article that was designed to claim his attention. In the display of class goods, such as Nickeled and Enameled Ware, or Cutlery, it is the class that attracts the attention and not the individual articles. People will then stop and look at the individual articles in the class. Where several different kinds of articles are displayed at one price, it is the *price* that attracts and not the goods.

Extensive Show Window Advertiser in Illinois Advises One Article:

After a good many years' experience we think it better to put only one article in a window at a time. There is an old saying: "If you dazzle them you've got 'em." By placing a large quantity of a certain article in one window it attracts attention to the particular article more than if you had a number of articles in the window. When a number of articles are in the same window a person does not pay any particular attention to any of them, but when filled full of one article it cannot help but attract a great deal of attention.

Group Similar Articles, Advises North Carolina Dealer:

Unless lines naturally fall together they should not be displayed in one window. Fire Shovels, Tongs, &c., can fill in very nicely with a display of Stoves. Ice Picks, Lemon Squeezers and such articles would drop in very nicely with Ice Cream Freezers. We would not combine a window, however, with Ice Cream Freezers and another article entirely separate, for instance Carpenters' Tools.

Illinois Merchant Believes in Concentration:

We believe in concentration, and think that one line properly displayed has a much better result than to include several lines, especially if they are dissimilar. Kindred lines, such as Pocket Knives, Razors and Scissors, will blend harmoniously, and may be an exception to the rule.

One at a Time, Recommends New York Merchant:

One kind of goods at a time on as elaborate a scale as stock and window room will permit. If it is only Tin Pans, let it be Tin Pans on a large scale for a short time, and then change to something else.

Michigan House Advise Mixing Lines During the Holidays:

From our experience we believe it is more profitable to display wholly one line in a show window, although at certain periods of the year, especially at the holiday season, several lines may be displayed with profitable results.

Illinois Merchants Limit Displays to One Line:

When we trim our windows we put in one window one week nothing but Cutlery; next week nothing but Lanterns; next week nothing but Sad Irons, all kinds, shapes and sizes; another week nothing but Paints; another week nothing but Brushes, and so on throughout the year.

Mixed Displays May Be Used Occasionally, Say Tennessee Firm:

It is generally better to display goods of one line at one time, but for a change it makes a very attractive display to put goods of different lines in your window, provided the one dressing the window uses good taste in his work.

A Lot of One Thing Makes Impression, Says Connecticut Merchant

A lot of one thing makes a permanent impression where a little of several would not be noticed. If

properly arranged and changed often, one line seems to us much better than more.

Never Mix, is Policy of Enterprising Minnesota House:

We never under any circumstances mix goods in our window displays. If we want to show more than one line we divide the window, but even that ought to be avoided where it is possible.

Minnesota Dealer Divides Window in Sections When Mixing Lines:

We show only one line when there is assortment enough of that line to make a display. Otherwise we try to divide the window into sections, having goods displayed classified.

Ohio Merchant Finds One Article Makes More Sales:

We find that an attractive display of one article or line makes a better impression and more sales than a large number of different articles.

One Line, Advise Massachusetts House:

One line, and make a very large display. One Hammer might not attract attention, but a window full would.

Massachusetts Dealer Shows Only One Line at a Time:

We display only one line of goods at a time, trying to make it as complete and as near seasonable as possible.

A SUGGESTION.

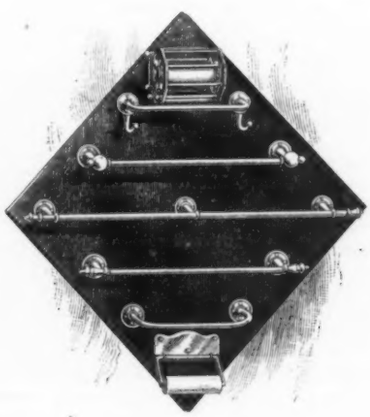
In a Western city a merchant recently displayed in his window the following sign:

CAST IRON SINKS.

After a small boy had discovered the joke the sign attracted considerable attention. Many people who had before passed down the street looking straight ahead paused and glanced in the window at the sign, assumed an amused expression and went on. The sign was talked about and the public was made familiar with the name over the door.

SHOWING BATHROOM FIXTURES.

Bright nickel bathroom fixtures may be attractively exhibited on a home made display board, such as is shown in the accompanying illustration. This display



Display Board for Bathroom Fixtures.

board, measuring about 3 feet square, is made of 1-inch boards battened together at the ends. This is covered with cloth, stretched tightly and tacked on. The Towel Racks, Paper Holders and any other goods it is designed to show are screwed to the board and the board hung up on the wall or in the show windows. A dark background sets off the nickel goods in a very effective manner. Material of color may be used that will harmonize with the surroundings, the darker shades being preferable, as they make a greater contrast with the bright nickel than lighter colors. Black velvet, which is quite expensive, is the ideal background on which to show these goods and always produces a very rich and elegant effect. A surprisingly good impression may be obtained by the use of some cheaper material, such as cambric or paper muslin.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

The entire business of the S. B. Hubbard Company, Jacksonville, Fla., was destroyed in the great fire in that city on the 3d inst. The company will resume business as soon as possible, and request catalogues, &c., from manufacturers, as all their trade literature was consumed by the flames. They are wholesale and retail dealers in Hardware, Stoves, Tinware, Doors, Sash, Blinds, Farming Tools, Iron, Steel, Paints, Oils, Plumbing and Steam Fitting Supplies, &c.

E. J. Fuller's store at Kendall, N. Y., was burned out a few days since, the entire stock and building being destroyed. The loss on stock was about $3800, with insurance of about $2000. Mr. Fuller will be pleased to receive catalogues and price-lists relating to Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Pumps, &c.

W. W. DICKINSON HARDWARE COMPANY'S SOUVENIR.

W. W. DICKINSON HARDWARE COMPANY, Little Rock, Ark., have just issued an attractive and unique illustrated souvenir of 75 pages, 12 x 9 inches in size. This company handle at wholesale Shelf and Heavy Hardware, Tinware and Enameled Ware, Stoves and Hollow Ware, Refrigerators, Pumps, Iron and Steel, Iron Roofing, Logging Tools, Mill Supplies, Wagon Material, Agricultural Implements, Farm and Log Wagons, Vehicles, Harness, Saddlery and allied goods. On various pages are portraits of the officers and directors, office force, traveling and house salesmen, stock men and colored helpers, supplemented by views of their warehouses at 405 to 411 and 414 to 420 East Markham street, together with admirable illustrations of the main office, retail, packing, shipping, Stove, Pump, Mill Supply, Vehicle, Machinery and other departments.

L. SCHREIBER & SONS COMPANY.

THE L. SCHREIBER & SONS COMPANY have purchased a large tract of land in Norwood, a suburb of Cincinnati, and will build a large structural and architectural iron plant. The property includes 18 or 20 acres, and extends from Montgomery road and Ivanhoe avenue westward to the Cincinnati, Lebanon & Northern Railroad. The construction of the buildings will be begun as soon as the plans are prepared, though it is not expected that the new plant will be occupied for several months, and probably nearly a year will elapse before the business is all located in the new place.

A newspaper dispatch describes a bold and unique robbery which took place in an Illinois town a few days since. A stranger walked into a Hardware store and bought a Revolver and a box of Cartridges. He then deliberately loaded the Revolver and covering the proprietor relieved him of a considerable amount of cash. The desperado then made his escape.

O. CHAN WELLS, 10 Havemeyer Building, New York, is the Eastern sales representative of the Chattanooga Pipe & Foundry Company, Chattanooga, Tenn., manufacturers of a full line of Soil Pipe and Fittings, and kindred goods.

AMONG THE HARDWARE TRADE.

Walton L. Colby is successor to the general Hardware business formerly conducted by Judd & Colby, New Lothrop, Mich.

Higgins, Wasgatt Hardware Company are successors to J. F. Wohlhuter & Co., dealers in Hardware, Stoves, Tinware, &c., Albert Lea, Minn. The company have been incorporated with W. M. Wasgatt as president, and M. J. Higgins, Jr., as secretary and treasurer.

Gilkey-Jarboe Hardware Company have succeeded Gilkey Bros. in the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., with stores at Chickasha, Marlow and Duncan, I. T. The company have incorporated with a capital stock of $100,000, of which $60,000 has been paid in. They expect to establish other stores in the Fort Sill country as soon as it is opened up.

C. A. Ahrens is erecting a building at Marshall, Minn., for the purpose of entering the Hardware, Stove and Sporting Goods business.

L. Bobst Hardware Company, Kankakee, Ill., have been incorporated with a capital of $15,000. L. Bobst is president of the company, and W. C. Bobst, secretary and treasurer. They are dealers in Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods; also iron and slate roofing, furnace work, &c. Their building has been enlarged and they now have three floors, 25 x 145 feet.

W. B. Henderson has lately entered the Hardware, Stove and Farm Implement business in Sterling City, Texas. Mr. Henderson will move to a new building about June 15 next.

S. P. Coan has disposed of his Hardware business in Brookfield, Mo., to Harris & Fant, who continue at the old stand.

J. F. Johnson Hardware Company, wholesale and retail, Greenville, Ala., are putting up a new building for their business. This building, 50 x 110 feet, with their warehouse on the L. & N. Railroad, will give them an approximate floor space of 20,000 square feet, and very much improve their facilities for handling goods.

The Hardware stock of H. B. Scott, Champaign, Ill., was recently damaged by fire. The loss was fully covered by insurance. Mr. Scott is conducting a fire sale and will later put in an entirely new stock.

Seavey Hardware Company, Fort Wayne, Ind., have been making important improvements in their establishment, which is 40 x 150 feet in dimensions, four floors and basement. A new steel ceiling has been put in the main storeroom, several windows have been cut through the east wall and the entire interior has received a fresh coat of paint of an attractive tint. In addition to their large retail business, the company wholesale goods in Ohio, Indiana and Southern Michigan.

A. H. Beall Hardware Company, Williamson, W. Va., have suffered $1000 damage to their stock from fire. The loss is fully covered by insurance.

Marable Hardware Company, Clarksville, Texas, have increased their capital stock from $30,000 to $50,000. They have increased their jobbing business materially and added another man to their force on the road. After July 1 they will occupy a new building which is now in course of erection. This building is 125 x 200 feet. The second floor will be used as a Buggy repository. They also have warehouses, 30 x 175 feet and 25 x 50 feet, the latter for duplicate stock of Wagons, Buggies and Farming Implements. The company solicit correspondence from factories with a view to making arrangements for handling goods in large quantities.

CONTENTS.

	Page.
Turret Machine with Large Spindle Capacity. Illustrated	1
The Canadian Bounty Acts	3
Chilled Cast Iron Car Wheels at Present and in the Future	5
The Elmes Portable Hydraulic Press. Illustrated	7
The Distribution of Iron and Steel Exports in 1900	8
The McClintic-Marshall Construction Company	9
Central Pipe & Valve Company	9
The Eclipse Low Water Indicator. Illustrated	9
The Structural Iron Workers' Wages	9
The Suppression of Smoke	10
The Thomas Acme Air Washer and Purifier. Illustrated	10
Harbor Improvements at Chicago	11
The Colonial Steel Company	11
A Comparison Between American and British Rolling Mill Practice	12
The Bessemer Coke Company	16
The Burnham Drill Presses. Illustrated	17
The Oliver Mining Company	17
The St. Clair Ice Blockade	17
President Schwab Before the Industrial Commission	18
The Lunkenheimer Sight Feed Lubricator. Illustrated	25
The Lake Superior and Ontario Consolidation	25
Canadian News	26
Notes from Great Britain	27
The Department Store Law in Germany	28
Australian Notes	29
The Carnegie Tube Company	29
The Week	29
Editorials:	
Panics	30
The Diversion of Speculation	30
The Pension System as Applied to Manufacturing Industries	31
The Mechanical Engineers' Meeting	31
The American Steel Hoop Company	31
Conference of Labor and Capital	32
The Business Situation	33
Jones & Laughlins' New Additions	34
Personal	34
The Oliver Iron Mining Company	35
Trade Publications	35
Aluminum-Zinc Alloys	36
Manufacturing:	
Iron and Steel	37
Machine Tools	37
General Machinery	37
Engines and Boilers	38
Buildings and Bridges	38
Foundries	38
Hardware	39
Miscellaneous	39
A Tour of Inspection	39
The American Sheet Steel Company	39
The Iron and Metal Trades:	
A Comparison of Prices	40
Chicago	40
Pittsburgh	42
Philadelphia	43
Cincinnati	44
Cleveland	44
Birmingham	45
New York	45
Metal Market	45
The New York Machinery Market	46
A Co-operative Sheet Steel Mill	47
The Struthers Sheet Mill	47
Obituary	47
Iron and Industrial Stocks	48
The Machinists' Demands	49
Hardware:	
Condition of Trade	51
Notes on Prices	53
Evolution in Business	55
Hardware Organizations:	
New England Hardware Dealers' Association	55
Arkansas Retail Hardware Dealers' Association	55
Southern Hardware Jobbers' Association	56
The Testing of Fire Arms	56
Canadian Paint Regulations	56
Notes on Foreign Trade	57
Union Metallic Cartridge Company's New Price-List	59
Trade Notes	59
Show Window Display	60
Requests for Catalogues, &c	61
W. W. Dickinson Hardware Company's Souvenir	61
L. Schreiber & Sons Company	61
Among the Hardware Trade	62
Richmond Shovel & Tool Company	63
Atlas Pipe Wrench Company	63
Danville Bessemer Company	63
W. A. Lawrence & Co.	63
Miscellaneous Notes:	
Nail Packing Box	63
Lee Bread Crumber	63
R. R. M. Stone Surfaced Roofing	63
Ruberoid Flooring	64
Camp Companion. Illustrated	64
Improved Self-Melting Wax Strings. Illustrated	64
The Fan Lawn Rake. Illustrated	64
Current Hardware Prices	65
Current Metal Prices	72

RICHMOND SHOVEL & TOOL COMPANY.

THE RICHMOND SHOVEL & TOOL COMPANY, Richmond, Ind., have been incorporated with a capital stock of $100,000 and the following officers: E. G. Hibberd, president; Henry A. Urban, vice-president, and Samuel W. Gaar, secretary and treasurer. They have a thoroughly equipped and up to date Shovel plant, with a capacity of 200 dozen per day, and have just commenced operations. In addition they have a complete Handle factory, which has been in operation for several weeks past, during which time, we are advised, more than 12,000 dozen Handles have been turned out. Henry A. Urban, the vice-president of the company, has been identified with the manufacture of Shovels for many years, and is well and favorably known to the trade. The company are also contemplating the erection of a steel sheet mill, the product to be used in the manufacture of their own line of goods, so that they will be in a position to supply all necessary raw material.

ATLAS PIPE WRENCH COMPANY.

THE ATLAS PIPE WRENCH COMPANY of New York and San Francisco have a complete exhibit of Pipe Wrenches at the Pan-American Exposition at Buffalo. All sizes of the Wrench are on exhibition, and the different uses to which the Pipe Wrench is put by the steam fitter, plumber, engineer and all other users of Pipe Wrenches are shown by an expert workman, who will demonstrate the superiority which is claimed for the Atlas Pipe Wrench to those visitors interested in pipe fitting and the advances made in tools for that purpose. The quality of the steel used in the manufacture of the Atlas Pipe Wrench and the finish and workmanship are shown in Wrenches in their various stages of manufacture from the bar steel to the finished product. The company advise us that their Pipe Wrenches are now on sale by Hardware, plumbing and engineering supply dealers throughout the United States and Europe.

DANVILLE BESSEMER COMPANY.

DANVILLE BESSEMER COMPANY, Danville, Pa., are equipping that portion of their rolling mill plant which was rebuilt last year, 150 x 152 feet, together with adjunct buildings, as a first-class factory for a complete line of Shovels and Scoops of every variety, with a capacity of 250 dozen per day. The company have a 15-ton open hearth furnace, and will do their own sheet rolling in rolling mill annex to factory. A building, 125 x 50 feet, will also be equipped with the most approved type of Handle machinery, and will have a capacity of 3000 Handles per day. In addition the company will engage in manufacturing other stamped steel plate ware on specifications and will furnish estimates on application. They are also equipping a plant for the manufacture of Mineral Wool. The company advise us that their contracts for machinery are all placed and that the work of equipment is rapidly progressing. Special attention will be given to the quality and workmanship of their products.

W. A. LAWRENCE & CO.

W. A. LAWRENCE & CO., formerly located in Newark, N. J., have recently taken a floor at 10 Warren street, New York, where as manufacturers' representatives and commission merchants they carry large lines of samples of many well-known lines peculiar to the House Furnishing Goods trade. Their business in the past has been confined largely to New York, New Jersey and Pennsylvania, but they are now reaching out into New England and Western territory as well as for export. They show large lines of samples but carry no stock, orders being shipped direct from factory and billed either by the manufacturer or themselves, some customers preferring one invoice instead of several where purchases include different lines. Among the concerns they represent are Cooper & McKee, Brooklyn, N. Y., Stove Boards and Refrigerators; Rome Mfg. Company, Rome, N. Y., nickel plated Copper Ware; Silver & Co., Brooklyn, House Furnishing Specialties; A. F. Bannister & Co., Newark, N. J., Table Cutlery; Bless & Drake, Newark, Sad Irons; Marietta Casting Company, Marietta, Pa., Hollow Ware; W. H. Sweeney Mfg. Company, Brooklyn, Tinware Specialties, together with lines of Enameled, Galvanized and Tin Ware, Mica and Wire Goods, Stove Pipe, Elbows, Fiber Lunch Boxes, Tinners' and Plumbers' Supplies, Sheet Metal Goods and various Hardware Specialties.

MISCELLANEOUS NOTES.

Nail Packing Box.

H. L. Collins Company, St. Paul, Minn., are putting on the market knock down nail packing boxes for handling and retailing nails. The boxes are made of heavy, strong board, cut, greased, glued up and slotted, so that they can be made up instantly, but are delivered knocked down, thus taking up but little room in shipping and packing away in store. The points are made that the boxes are a great time saver, in that a boy can put up the nails at odd moments, so that they are ready at all times and save the time of the clerks; that the advertisement of the firm, which is printed on the package, is worth something; that the customer will appreciate the package and the method of putting up the nails, and that there is no waste or mixing of the nails in the store. The packages are made in four sizes, No. 1 holding 1 pound, No. 2, 2, 2½ or 3 pounds; No. 5, 5 pounds, and No. 10, 10 pounds. The company will be pleased to send samples on application.

Lee Bread Crumber.

Goodell Company, Antrim, N. H., and 10 Warren street, New York, owing to the popularity of their Lee bread crumber for hotels, restaurants, &c., illustrated in *The Iron Age* of August 9, 1900, have just put on the market a fourth size, the smallest yet, suitable for family use and moderate in price, as compared with the others. The value of this device, which shreds or crumbs stale bread or bread 24 hours old, equally well, is in the fact that what in many families is wasted can be quickly granulated as a base for many wholesome dishes, such as puddings, griddle cakes, dressings for poultry, game, fish and meats, as well as for use in the making of croquettes, fritters and the frying of fish, oysters, clams and a variety of culinary purposes for which it is much superior to cracker crumbs, meal or flour. This machine has a set of three iron cylinders on each of which are four rows of steel pins about ⅛ inch in diameter, revolving in opposite directions, the opening at the top being 4 to 3½ inches. It is 7½ inches high, stands on four legs, is operated by a crank and is aluminum finished. There are three larger sizes, one of which, a 5 horse-power machine, will crumb a barrel of bread in five minutes.

R. R. M. Stone Surfaced Roofing.

R. R. Mabie, 154 Chambers street, New York, dealer in building and roofing papers, has recently put on the market an asphalt stone surfaced roofing material, sold in rolls and branded R. R. M., each initial being in an oval link and the three links joined as in a chain. This is in response to a growing demand for ready roofing finished on the surface with fine gravel. It is made from two sheets of asphalt or coal tar saturated paper cemented together with asphaltic or coal tar cement and finished on the wearing side with fine seashore grit ranging in size up to about the gauge of small peas. The advantage in this form of roofing over two or three ply prepared roofing, otherwise tarred roofing paper, it is explained, is that it has a finished wearing surface not obtainable when the materials are assembled on the roof, as the passing of the strips of material through the hot cement and then with the gravel through rollers which imbed the grit in the preparation firmly and give increased uniformity and stability. It also presents a

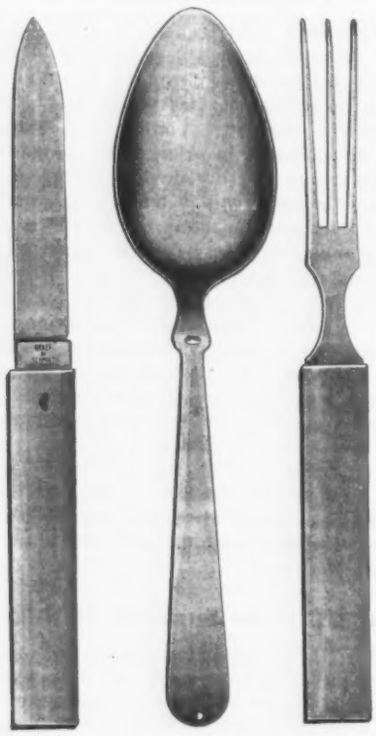
finer appearance than the ordinary prepared roofings and is said to last three times as long.

Ruberoid Flooring.

One of the specialties produced by the Standard Paint Company, 100 William street, New York, manufacturers of what is known in the trade as P. & B. products, is Ruberoid flooring. This is a floor covering material made usually in yard wide strips and sold in rolls at a less price than medium grades of oil cloth, it being listed regularly at 4 cents a square foot and subject to a trade discount. It affords a good walking surface, has a certain amount of elasticity, offering less resistance than wood or oil cloth and possesses excellent deadening qualities. It is said to be absolutely water, acid, alkali and vermin proof and is easily kept clean. It is free from any odor and laid in strips makes a close joint without nailing or fastening in any way. Attractive designs can be painted on it, as was done on some for one of their offices in John street four years ago, which was in such good condition recently that when moving into larger and more commodious offices at the address above, they relaid it at the entrance to the suite of rooms there, using the regular goods for the large main offices. Its long life under exacting conditions makes it desirable flooring for mills, factories, engine rooms, breweries, &c., while its neat appearance makes it suitable for covering floors in stores, offices and similar surfaces.

Camp Companion.

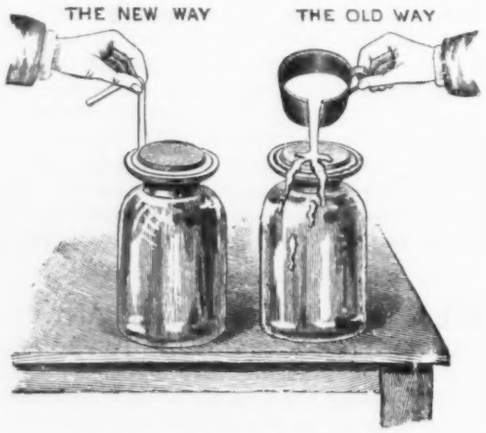
Graef & Schmidt, 107 Chambers street, New York, have just put on the market the Camp Companion, here illustrated half size. It is intended for campers, excursionists, travelers, picnickers, &c. The knife blade and tines of the fork are steel and the handles German silver, so made that for carrying both blade and tines are sheathed or nested in the opposite handle, making a parallelopipedon 9-16 x 7-32 x 6⅝ inches in size. The spoon, also of German silver, has a T near the bowl, which fits into a corresponding slot in the knife handle, so that a quarter turn clamps all together rigidly in one harmless compact package, and slipped into a neat shaped leather case with clasp, can be readily carried in the pocket. The three pieces are finely polished and nickeled. The knife and fork are also sold separately by the dozen pairs.



Camp Companion.

Improved Self Melting Wax Strings.

C. C. Fouts, Middletown, Ohio, has secured the sole agency for the United States and Canada for the improved self melting wax strings, the advantage of which is shown in the accompanying illustration. The strings are referred to as being adapted to use on stone, glass or tin cans, and as being very adhesive. It is stated that there will be no failure in fruit keeping if directions are strictly followed, and that fruit has been successfully shipped in glass jars over 2000 miles sealed with these strings. Among other points of excellence the following are enumerated: That the strings are economical, reliable, durable, convenient and non-poisonous; that the cans, once sealed tight, will remain tight for years; that the strings will not come loose from heat or cold and will stand freezing; that they will not come loose from contraction or expansion, and that there is no trouble in opening a can or jar. The goods are put up in pasteboard packages containing 100 strings, ten packages in a box and five boxes in a case.



Improved Self Melting Wax Strings.

The Fan Lawn Rake

The accompanying cut shows a lawn rake put on the market by the Fan Lawn Sprinkler Company, 109 California street, San Francisco, Cal. The rake head is made of hard wood, with common 16-penny wire nails as teeth. The heads of the nails are flattened on two sides to fit a groove in the top of the rake head, to make it impossible for the teeth to turn or get out of line. A strip of wood is set in the groove in the head after the teeth are in place, and upon the top of the head is fastened the hard wood cap. The teeth are ⅝ inch apart from center to center, with the lower portions bent, as shown in the cut. The handle is of hard wood, braced. The rakes are made in two sizes—No. 1, with 20-inch head and 31 teeth; No. 2, with 26-inch head and 41 teeth. The company have so far only been able to supply their coast trade, but are arranging to increase their facilities extensively so as to supply the goods in large quantities, when they will be able to accept orders from the Eastern trade.

The Fan Lawn Rake.

The Apollo Lawn Sweeper.

The Greene Mfg. Company, Springfield, Ohio, are offering the lawn sweeper shown in the accompanying

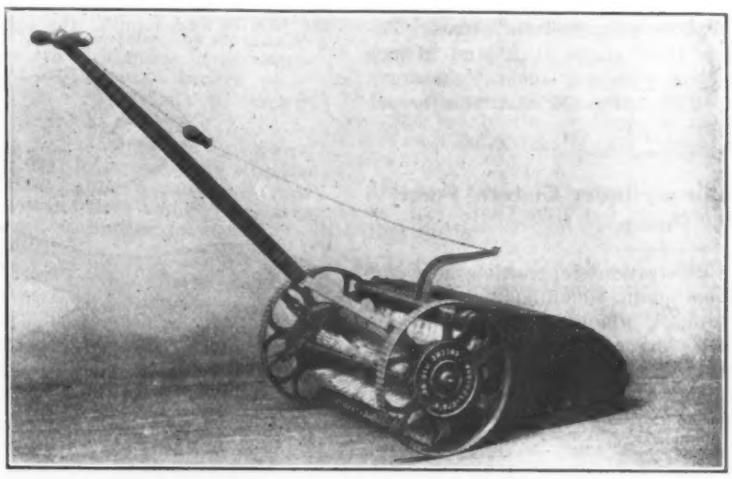


Fig. 1.—The Apollo Lawn Sweeper.

cuts. The machine consists, as illustrated in Fig. 1, essentially of a revolving brush, which throws the cut and dead grass, leaves, paper, dirt, &c., forward into a receptacle, removing such refuse from a lawn, it is explained, in less time than it takes to mow it. The manner of emptying the sweeper is shown in Fig. 2, this being accomplished by a single pull on the handle attached to the chain. In Fig. 3 the grass pan is shown released entirely from the machine, to allow sweeping in corners or terraces, or to permit the sweepings to be emptied directly into a wheelbarrow or cart. This is accomplished, it is shown, by raising the handle of the machine, it not being necessary to touch the grass pan with the hands. It is not an attachment for a lawn mower; therefore, it is remarked, it will sweep sidewalks, paved streets, or any plane surface. The brush is made of tampico, which is referred to as a tough, durable fiber. A small lever at the right side of the

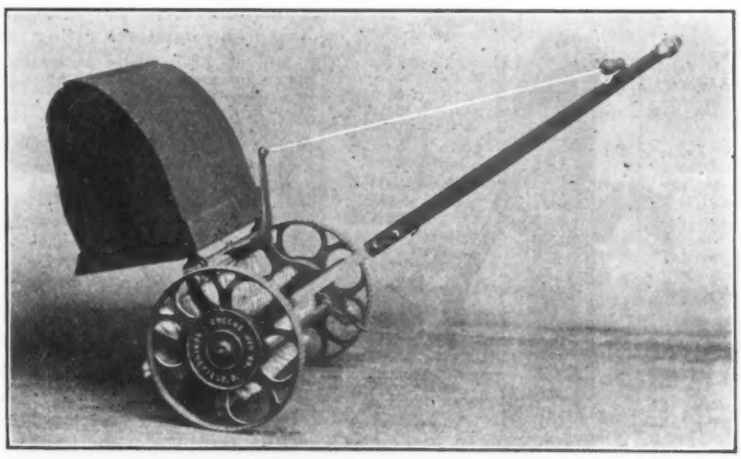


Fig. 2.—Emptying the Sweeper.

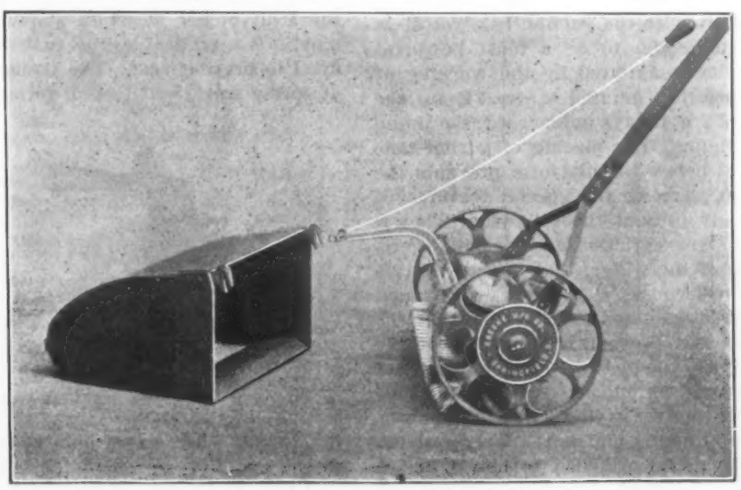


Fig. 3.—Grass Pan Released.

machine allows the brush to be adjusted to any desired hight, and the brush is hung on links in such a manner as to raise automatically to pass over large stones or obstructions. The manufacturers allude to the machine as handsome in design, attractive in appearance, and as being well built in every particular, wrought or malleable iron being used wherever any strain comes. The sweeper is furnished in three sizes, 20, 24 and 28 inch sweep, with 15-inch drive wheels to make light draft. All iron work is finished in rust proof aluminum bronze enamel.

The Hayes Double Cylinder Cistern Force Pump.

The accompanying illustrations represent a new double cylinder cistern force pump, which has been brought out by the Hayes Pump & Planter Company, 10 Anchor street, Galva, Ill. The cylinders, instead of the plungers, are operated by the handle. This arrangement permits the rod to be placed on the outside of the pipe,

The Hayes Double Cylinder Cistern Force Pump.

thus doing away entirely with the stuffing box, yet making what the company claim to be a most powerful force pump. The water is agitated by the working of the cylinders, thus insuring aerated water. From the fact that the cylinders are always submerged, the pump can never lose its priming. The placing of a vent hole in the pipe 4 or 5 feet below the platform prevents the freezing of the pump. Among the special features of this pump the company present the following: That it has no packing box to cause friction and leakage, thereby stopping the force of the water; that the use of two cylinders instead of one causes a steady pressure, and thereby gives a much larger stream of water; that the use of a brass valve seat prevents the rusting of the seat, which is, therefore, made very durable, and that the cylinders being placed on opposite sides of the pipe are perfectly balanced, thereby saving half of the power, as the weight of the rod nearly equals the weight of the water. A wind mill can be attached to one cylinder, leaving the other one to be worked by hand without detaching the mill, thereby giving the advantage of two single pumps, as the cylinders act independently of each other. The company have also brought out a new single cylinder force pump, which is operated on the same principle, except that only one cylinder is used.

Combined Wire Cutter and Gas Pliers.

In Fig. 1 of the accompanying cuts is shown improved combination pliers offered by Billings & Spencer Company, Hartford, Conn. A new feature consists of an improved cutting device. A hole is drilled through the jaw of one handle, the operation of cutting being

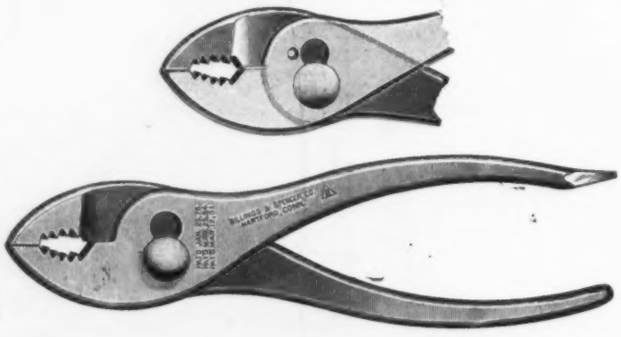


Fig. 1.—Combined Wire Cutter and Gas Pliers.

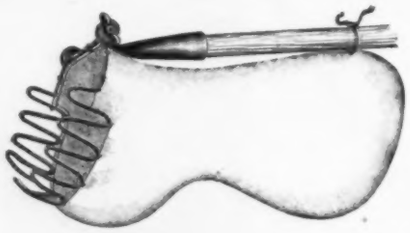
performed by passing the wire through this hole and through the opening in the other handle. When the wire is in the required position the cutting is accomplished by pressing the handles together in the same manner as would be done when using the plier regularly. Wire up to one-tenth inch in diameter can, it is explained, be easily and evenly cut. The whole tool is referred to by the manufacturers as exhibiting accurate mechanical workmanship, and the fitting, finish and assembling of the tool as first class. A patent has recently been ob-

Fig. 2.—The Hayden Wire Cutter and Gas Pliers.

tained on the cutting device. The Hayden wire cutter and gas pliers, put on the market by the same company, is illustrated in Fig. 2. The wire cutters are made interchangeable from best tool steel, and can easily be inserted in the plier. The handles are heavy and stiff to prevent spring in them. The goods are furnished in 6, 8 and 10 inch sizes, and extra cutters can be obtained separately.

Allen's Practical Fruit Picker.

The Meilink Mfg. Company, Toledo, Ohio, are offering the fruit picker herewith shown. The shank for the handle is a malleable iron casting, finished in black enamel to prevent rust. The frame supporting the bag is of spring steel, well tinned, formed in the shape of elas-



Allen's Practical Fruit Picker.

tic grappling fingers. The adjustment of the wire frame to the shank is by means of a thumb screw and bolt. The bag is of light canvas, securely fastened to the wire frame. The picker can be operated from the ground and is adjustable to any angle. The fruit, it is explained, does not fall directly into the lower receptacle of the bag, but into the heel or upper part, thus preventing injury to delicate or overripe fruit.

Current Hardware Prices.

REVISED MAY 14, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 83⅓@33⅓&10% signifies that the price of the goods in question ranges from 83⅓ per cent. discount to 83⅓ and 10 per cent. discount.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00...33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 7¼@7¾c
Hay-Budden, Wrought.....8¢@9¼c
Horseshoe brand, Wrought. 9¼@9¾c
Samson.....₩ lb 7¼@8c
Trenton, Wrought.....₩ lb 8¼@8¾c

Imported—

Armitage's Mouse Hole.....8¾@9¼c
Peter Wright's.....9¼@9¾c

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull & Hoyt Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@...%
Boring Machine Augers.....60¢10¢10@70¢10%
Car Bits, 12-in. twist.....60@60¢10%
Jennings' Pattern:
Auger Bits.....50¢10¢5@50%
Ford's Auger and Car Bits..
40&10@40&10&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40%
No. 30. R. Jennings' List.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits15&10@15&10&5%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, $18; large, $26.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....60%

Gimlet Bits—

Common Double Cut..gro. $2.25@2.75
German Pattern.....gro. $3.25@4.50
Double Cut, makers' lists.....
50¢5@50&10%

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames.....25&10%
New Patent.....25&10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered.gro.65@66c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. $1@1.4c
Unhandled, Shouldered.gro.65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands.$5.50@5.75
First Quality, other brands$5.25@5.50
Jobbers' Special Brands:
Good Quality.....$5.00@5.25
Best Quality.....$5.25@5.75
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—*Iron or Steel.*

Concord, Loose Collar....4½@5c
Concord, Solid Collar....4¾@5½c
No. 1 Common.....3¼@3¾c
No. 1½ Com. New Style..3¼@4 c
No. 2, Solid Collar.....4¼@4½c
Nos. 11 to 14.....70¢10@75¢
Nos. 15 to 18.....60¢10@60¢10¢5%
Nos. 19 to 22.....75¢5@75¢10%

5% cash 10 days.

Boxes, Axle—

Common and Concord, not turned..
lb. 5c
Common and Concord, turned..lb. 6c
Half Patent.....lb. 8@9c

Balances—Sash—

Caldwell new list.....50%
Pullman's.....60%

Spring—

Spring Balances ... 5¼&10@50¢10¢5%
Chatillon's Light Spr. Balances...40&10%
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50%
Chatillon's Large Dial.....30%
Pelouze.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb..
2 90@3.10c

Beams, Scale—

Scale Beams, List Jan. 12, '98.30¢10%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters—Egg—

Standard Co.:
No. 5 Steel Handle Dover, ₩ gro. $6.50
No. 10 Cast Handle Dover..₩ gro. $8.00
No. 10 Steel Handle Dover, ₩ gro. $8.00
No. 15 Extra Heavy Steel Handle, ₩ gro. $15.00
Rival, ₩ gro.....$10.00
Taplin Mfg. Co.: ₩ gro.
No. 50 Small Family size.....$6.50
No. 100 Regular Family size.....$8.00
No. 102 Regular Family size tinned...
$9.50
No. 150 Large Family size.....$15.00
No. 152 Large Family size, tinned...
$17.00
Lyon's, Standard size.....₩ doz. $1.75
Wonder (S. S. & Co.).....₩ gro. $7.50

Bellows—

Blacksmith, Standard List.70@70¢10%
C. E. Jennings & Co., Blacksmith..60¢10%
C. E. Jennings & Co., Hand.....33⅓%

Blacksmiths—

Inch..	*3*	*3½*	*4*	*4½*	*5*	*6*
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*
Extra Length:						
Each	*$4.00*	*4.55*	*5.10*	*5.60*	*6.40*	*7.50*

Net Prices.

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.7*	*6.75*

Bells—Cow—

Ordinary goods.....75¢5@75¢10%
High grade.....70@70¢10%
Jersey.....75&10%
Texas Star.....50&10%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....20&10&10%

Hand—

Hand Bells, Polished.....60¢5@66⅔%
White Metal.....55@55&10%
Nickel Plated.....50@50¢10%
Swiss.....60@60¢7½%
Silver Chime.....38¼@38¾&10%

Miscellaneous—

Farm Bells.....lb. 2@2¼c
Steel Alloy Church and School.....
50¢10¢5@60%
Wilmot & Hobbs Mfg. Co., Gongs.....70%

Belting—Rubber—

Agricultural (Low Grade).75¢10@80%
Common Standard.....75@75¢10%
Standard.....70@70¢10%
Extra.....60¢10¢5%
High Grade.....50¢10@50¢10¢5%
Boston Belting Co.:
Seamless Stitched, Imperial.....45%
Boston.....60&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap...50¢10@60%
Regular Short Lap 60¢10@60¢10¢5%
Standard.....60¢10¢10@70¢5%
Light Standard.....70@70¢10%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters...
40&50%

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—
See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70@70¢10%
Cleveland Steel.....50&10@60&10%
Ford's Star Brand Self Lubricating...
60&10%
Hollow Steel, Ford's Pat. Star Brand...
50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c.....40¢10@...%

Bolts—Carriage, Machine &c.—

Common, list Jan. 30, '95...65&10@...%
Norway Iron, $3.00, list Oct. 7, '85...
80@80¢5%
Phila. Eagle, $3.00 list May 24, '99....
80@80¢10%
Bolt Ends, list Jan. 30, '95.70¢7½@...%
Machine, list Oct. 1, '99.....70¢7½@...%
Machine with C. P., C. & T. Nuts.
65¢12½%

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.57*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel .....70¢10@75¢5%
Wrought " Bronzed.40¢5@50¢10%
Wrought Flush, B. K..50¢10@60¢10%
Wrought Shutter...40¢10¢10@60¢5%
Wrought Square Neck.....50@50¢10%
Wrought Sunk.....50@50¢10%
Ives' Pat. at Door.....60%

Stove and Plow—

Plow.....60¢10@...%
Stove.....77½@77½¢10%

Tire—

Common.....75@75¢10%
Norway Iron.....80@80¢5%
American Screw Company:
Norway Phila., list Oct. 16, '94....82½%
Eagle Phila., list Oct. 16, '94.....85%
Bay State, list Dec. 28, '99.....77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..82½%
Eagle Phila., list Oct. 16, '94.....85%
Eclipse, list Dec. 28, '99.....77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....77½%
Keystone Phila. list Oct. '84.....85%
Norway Phila., list Oct. '84.....82½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz..	*$3.50*	*4.50*	*5.00*	*6.50*
Inch		*2¼*		*2½*
Per Doz.....		*$7.50*		*10.25*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25@30%

Boring Machines—See *Machines, Boring.*

Boxes Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*

Common Ball, American..$1.15@1.35
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford s.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
P., S. & W. Co., Peck's Patent50&10@60%

Brackets—

Wrought Steel.....70¢10@75¢5%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....75%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96.....40@40¢5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50¢10%
Fast Joint, Narrow.....50@50¢10%
Loose Joint.....70¢5@70¢10%
Loose Pin.....70¢5@70¢10%
Mayer's Hinges.....70&5@70¢10%
Parliament Butts.....70¢5@70¢10%

Wrought Steel—

Loose Joint.....
Table and Back Flaps..
Narrow and Broad.....
Inside Blind..... } *70¢10@75%*
Loose Pin.....
Loose Pin, Ball and Steeple Tip

Bronzed Wrt. Nar. and Inside Blind Butts.....50¢10@60%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
2000, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses, Calks.*

Toe and Heel—

Blunt 1 prong.....per lb. 4@4½c
Sharp, 1 prong.....per lb. 4½@4¾c
Perkins' Blunt.....₩ lb 5 ¢
Perkins' Sharp.....₩ lb 5½¢

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 75	2.10	2.25	each.
Iowa Pattern...	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	30	30	40	qts.
New York Patt'rn	3.00	3.25	3.40	each.
Balt more P.tt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	108 gro.

Caps—Percussion—

Eley's E. B.....50c
G. D.....per M 32@34c
F. L.....per M 37@40c
G. E.....per M 47@50c
Musket.....per M 57@60c

Primers—

Berdan Primers, $1.00.....5%
B. L. Caps (*Sturtevant Shells*) $1.00.....5%
All other primers .....$1.10@$1.15

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
32 C. F., $5.50.....10@5%
38 C. F., $7 00.....10@5%
22 cal. Rim, $1.50.....10@5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con., Ball Swgd.....$1.90
B. B. Caps, Round Ball...$1.12@1 18
Central Fire.....25%
Pistol and Rifle.....15@5%
Primed Shells and Bullets.....15@5%
Rim Fire Sporting.....50%
Rim Fire, Military.....15@5%

Casters—
Bed.....70@70@10%
Plate.....75@75@10%
Philadelphia.....75@75@10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phœnix).....45%
Payson's Anti-Friction.....70&10&10%
Standard Ball Bearing.....45%
Tucker's Patent, low list.....30%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
NOTE.—*Manufacturers usually quote Chain at delivered prices.*
American Coil, Cask lots:

5-16	¼	5-16	⅜	7-16	½	9-16
7.45	5.55	4.55	3.70	3.55	3.45	3.40

⅝ ¾ ⅞ to 1 1⅛ to 1¼ inch.
3.40 3.35 3.25c. per lb. 3.60 per 100 lb.
Less than Cask lots add 25c.
German Coil, list July 24, '97.60&10@10%

Halters and Ties—
Halter Chains.....50@10%
German Halter Chain, list July 24, '97.....60@10@10%
Cow Ties.....60%

Trace, Wagon, &c.—
Traces, Western Standard: 100 pair
6½—6-8, Straight, with ring...$30.00
6½—6-2, Straight, with ring...$31.00
6½—8-2, Straight, with ring...$35.00
6½—10-2, Straight, with ring...$38.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains..50&10%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron.....60@60@10%
Brass.....60@60@10%
Safety Chain.....70@5@70@10%
Gal. Pump Chain.....*lb* 4½@4¾c
Covert Sad. Works:
Breast, Hitching and Rein Chains..50%
Covert Mfg. Co.:
Breast.....35&2%
Halter.....35&2%
Heel.....35&2%
Rein.....35&2%
Stallion.....35&2%
Oneida Community:
Eureka Coil and Halter.....60@60&5%
Niagara Coil and Halter.....60@60&5%
Niagara Cow Ties.....45&5@45&10&5%
Am. Coil and Halters.....50&10&5@60%
Am. Cow Ties.....35&5@40&5%
Wire Goods Co.:
Dog Chain.....60&10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)
Carpenters', Blue.....*gro.* 45c
Carpenters', Red.....*gro.* 40c
Carpenters', White.....*gro.* 25c
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60@60&10%

Chests Tool—
American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc, Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....30%

Chisels—
Socket Framing and Firmer
Standard List.....70@70@10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70&5%
L. & I. J. White.....30@30&5%

Tanged—
Tanged Firmers.....40@5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....25%
L. & I. J. White, Tanged.....25&5%

Cold—
Cold Chisels, good quality.lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....*lb.* 8@9c

Chucks—
Beach Pat., each $8.00.....30%
Massey's Planer and Milling.....15@20%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard..30%
Drill Chucks, New Model.....2 -%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....20%
Universal Lathe Chucks.....40%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Czar Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%

Clamps—
Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co..40&10%
Carriage Makers' Sargent's.....50&10%
Besly, Parallel.....33⅓&10%
Lineman's, Udica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners Walk—
Star Socket, All Steel.....₱ doz. $4.00 net
Star Shank, All Steel.....₱ doz. $3.75 net
W. & C. Shank, All Steel, 7½ in. ₱ doz., $3.35; 8 in., $3.40; 8½ in., $3.50.

Cleavers, Butchers'—
Foster Bros.....30%
New Haven Edge Tool Co.'s.....40&10%
Fayette R. Plumb.....33⅓&10%
P., S & W.....33⅓&5@33⅓&10%
L. & I. J. White.....25%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet.....₱ doz. $7.30
Mascotte Toilet.....₱ doz. $3.40
Monitor Toilet.....₱ doz. $9.00
Stewart's Patent.....₱ doz. $10.00

Clips Axle—
Eagle and Superior ¼ and 5-16 inch.....70@10%
Norway, ¼ and 5-16 inch..70@70@10%

Cloth and Netting, Wire
—*See Wire, &c.*

Cocks, Brass—
Hardware list (Globe, Kerosene, Racking, &c.).....65@10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list.....40%
Embossed, Gilt, Pope & Stevens' list.30&10%
Leather Pope & Stevens' list.....40%

Compasses Dividers, &c.
Ordinary Goods.....70@10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....25&10%

Compressors Corn Shock—
J. B. Hughes' ₱ doz.....$3.00

Conductor Pipe, Galva.—
L. C. L. to Dealers:

Territory.	*Not nested.*	*Nested.*
Eastern....	70@7½%	70@10%
Central.....	70@5%	70@7½%
Southern..	65@2½%	65@5%
S. Western.	60@12½%	60@15%

Terms, 2% for cash.
Jobbers receive extra 12½@2½ on carloads loose, and extra 12½ on carloads crated.
See also *Eave Troughs.*

Coolers, Water—

Nos.	½	3	4	6
Labrador	$11.50	$14.00	$17.50	$20.00
8 gal.	$24.00			
Nos	3	4	6	8
Iceland..	$23.00	$25.00	$30.00	$37.50
10	14 gal.			
$57.00	$72.00			

Coopers' Tools—
See *Tools, Coopers'.*

Cord—Sash—
Braided, Drab.....*lb.* 25c
*Braided, White, Common, lb*17½@18c
Cable Laid Italian..lb. A, 18c; *B,* 16c
Common India.....*lb* 9 @9½c
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....*lb.* 12½@13c
Cable Laid Russia.....*lb.* 13½@14c
India Hemp, Braided.....*lb* 14@15c
India Hemp, Twisted.....*lb.* 10@12c
Patent India, Twisted.....*lb.*10@12c
Pearl Braided, cotton.....₱ ℔ 17@18¢
Massachusetts, White.....₱ ℔ 22½¢
Massachusetts, Drab.....₱ ℔ 16½¢
Eddystone Braided Cotton.....₱ ℔ 19¢
Harmony Cable Laid Italian.....₱ ℔ 18¢
Ossawan Mills:
Crown, Solid Braided White...₱ ℔ 18¢
Braided, Giant, White.....₱ ℔ 17¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson:
Braided, Drab Cotton.....₱ ℔ 32½¢
Braided, Italian Hemp.....₱ ℔ 32½¢
Braided, Linen.....₱ ℔ 49¢
Braided, White Cotton, Spot.₱ ℔ 28½¢
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....10%

Wire, Picture—
Braided or Twisted.....85@85&10%
Note.—There is a good deal of confusion in lists, some using old list and others the new list.

Corn Knives and Cutters
—See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant.....₱ gr. $24.00

Cradles—
Grain.....50%

Crayons—
White Round Crayons, gross.5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr.$1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow*

Cultivators—
Victor Garden.....₱ doz. $10.00

Cutlery Table—
"*Gross Goods,*" *list Jan.. '01..net@5%*
Extra 10% to purchasers of $250 worth in six months.
International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2 50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $2.40
No. 77 Medium Knives.....₱ doz. $2.25

Cutters—Glass—
Smith & Hemenway Co.....30%

Meat—
Hale's..Nos. 11 & 111 12 & 112 13 & 113
Per doz.. $10.80 13 20 18.00
American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Connecticut:

Nos.	0	1	8	10	12
Each..	$1.75	2.25	3.00	3.00	3.50

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.50	$4	$6

Dixon's, ₱ doz.....33⅓&10%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₱ doz. $23.75.....50&10%
Little Giant, ₱ doz.....33⅓@33⅓&5%

Nos.	305	310	312	340	322
	$35.00	$48.00	$44.00	$75.00	$68.00

Sterling.....33⅓&5%

Nos	1	2
Each	$2.00	$2.50

Miles' Challenge, ₱ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₱ doz. $24.00.....33⅓&5%
Woodruff's, ₱ doz.....40%

Nos	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$36

Tobacco—
All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise.....25@30%
National, ₱ doz. $21.00.....40%
Sargent's, ₱ doz. $24.00.....45&10%

Washer—
Appleton's, ₱ doz. $16.00.....50&10&10%
Bonney's.....₱ doz. $4.75

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz .$10.00
Iwan's Improved Post Hole Auger....40%
Iwan's Perfection Post Hole Digger...₱ doz. $9.00
Kohler's Universal.....₱ doz. $14.00
Kohler's Little Giant.....₱ doz. $15.00
Kohler's Hercules.....₱ doz. $12.00
Kohler's Invincible.....₱ doz. $10 00
Kohler's Rival.....₱ doz. $9.00
Kohler's Pioneer.....₱ doz. $9.00
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15 No. 3, $14; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill..each $1.50@$1.75
Blacksmiths' Self-feeding.....*each $3.75@4.00*
Breast, Millers Falls, each $3.00..15&10%
Breast, P., S. & W.....30@30&10%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automa.t: Drills Nos. 2 and 3.....16&4%
Johnson's Drill Points.....25&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....20@25%
Ratchet, Whitney's, P. S. & W....40&10%
Whitney's Hand Drill, No. 1, $10.00:
Adjustable, No. 10, $12.00.....33⅓&5%

Twist Drills—
Standard List.....60&5@65&5%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Baisey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....27½%
Champion.....40&10%
Douglass Mfg. Co.....20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay & Parsons' Ratchet.....35%
Goodell's Automatic.....50&10&10@50&10&10&5%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....45&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1,50,55 and 60.....50&10&10%
Nos. 20 and 40.....64½&10%
Screw Driver Bits.....₱ doz. 50@70¢
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....60&10%
No. 86.....70&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough Galvanized

Territory.	*L. C. L.*	
Eastern....	75@10@7½%	*Carloads extra 12½%*
Central.....	75@15%	
Southern.....	70@12½%	
S. Western...	70@10%	

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Egg Beaters—See *Beaters, Egg*
Egg Openers—
See *Openers, Egg.*

Elbows and Shoes—
Factory shipments.....60@60&10@5%
Perfect Elbows (S. S. & Co.).....40%

Emery, Turkish—

	¼ to ⅝	*¾ to 150*	*Flour*
Kegs.....*lb.*	5c	5½c	5¾c
½ Kegs....*lb.*	5¼c	5¾c	5¾c
¼ Kegs....*lb.*	5c	6c	
10-lb cans, 10 in case....	6¾c	7c	6c
10-lb. cans, less than 10....	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%

Faucets—
Cork Lined.....70@5@70@10@5%
Metallic Key, Leather Lined.....70@70@10%
Red Cedar.....60@50@5%
B. & L. B. Co.:
West's Lock, Open and Shut Key50&10%
John Sommer's Peerless Tin Key.....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Common Cork Lined.70%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's Perfection Cedar.....40%
Star.....60@60&5%
Star, Metal Plug new list.....40@40&5%
Lockport, Metal Plug, reduced list.60&5%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¾ and ⅞ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $66.00...40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands.....70@75&5%
Good Brands.....75&10@75&10@10%
Fair Brands.....80@80@10%
Second Quality.....80@10@80@25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....25%

Fixtures, Grindstone—
Net Prices:

Inch....	15	17	19	21	24
Per doz.	$2.60	2.75	3.00	3 50	4.40

Stowell's Giant Grindstone Hanger.....₱ doz $6.00
Stowell's Grindstone Fixtures.....50%
P., S. & W. Co.....50&10&10%
Reading Hardware Co.....30&20&10%
Sargent's.....60&10&10%

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Sept. 1, 1900, list.
Grain or Barley Forks, 18 to 20 inches.....70@6%
Hay, 2 tine.....65%
Hay, 3 tine.....66⅔%
Hay, 4 tine. Header and Barley Forks, 13 to 16 inches.....66⅔%
Manure, 4 tine.....70%
Manure, 5 and 6 tine.....70%
Spading.....70@5%
Iowa Dig-Ezy Potato.....65%
Victor, Hay.....66⅔%
Victor, Manure.....70%
Victor, Header.....60&30%
Champion, Hay.....66⅔%
Champion, Manure.....70%
Columbia, Hay.....66⅔&5%
Columbia, Manure.....70%
Columbia, Spading.....70%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&20&7½%
Acme Manure.....60&25%
Dakota Header.....70&10&2½%
Jackson Steel Barley.....70&10&2½%
Kansas Header.....65&20%
W. & C. Favorite Wood Parley 4 tine, ₱ doz., $5.00; 5 tine, $6.00
Plated.—See *Spoons.*

Frames—Saw—
Red, Polished and Varnished..doz. $1.15@$1.50
White.....*doz.* 75@80c

Screens and Frames—
See *Screens.*

Freezers, Ice Cream—

Qts...	2	3	4	6	8	10
Best.	$1.45	1 65	1.95	2.40	3.20	4.20
Good	$1 25	1.40	1.70	2.15	2.75	3.75
Fair.	$1.00	1.10	1 30	1.75	2.50	2.90

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—
Per 1000 Feet.

Hemp Fuse.....	$2.60
Cotton Fuse.....	2.90
Single Taped Fuse.....	3.25
Double Taped Fuse.....	4.20
Triple Taped Fuse.....	5.00

Waterproof

Gates, Molasses and Oil—
Stebbins.....80&10@80&10&10%

Gauges—
Marking, Mortise, &c.....55&10@55&10@10%

Barrett's Comb. Roller Gauge.....
₱ doz. $6.75@7.25
Stanley R. & L. Co.'s Butt & Babbet Gauge.....20&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....10&10&5%

Gimlets—

Nail, Metal, Assorted, gro. $1.50@1.75
Spike, Metal, Assorted gro. $3.00@3.50
Nail, Wood Handled, Assorted, gro. $4.00@4.25
Spike, Wood Handled, Assorted gro. $5.00@5.25

Glass, American Window

Jobbers' List, Sept. 1, 1900.

Less than Carloads.....85%
Carloads.....85&10&2½%

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 57½@50%
List B, Cans (½ pts., pts., qts.).....53½@48%
List C, Cans (½ gal., gal.).....25@45%
International Glue Co. (Martin's).....40&10@50%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Common Grade.....*gro.* $5.00@6.00
Dixon's Everlasting....10-₱ pails, ea. 85¢
Dixon's Everlasting, in bxs..₱ doz. 1 ₱ $1.20; 2 ₱ $2.00
Snow Flake: 1 qt. cans per doz. $2.00; 2 qt., $3.20; ½ gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 10%

Grindstones—

Pike Mfg. Co: Improved Family Grindstones, per in.....$2.00; Pike Mower Knife and Tool Grinder, each.....$6.00 } 33⅓%

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000.....$9.00
Copper ₱ 1000.....$18.00

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—

	gro.
Peg Patent, Leather Top	$4.90@5.25
Peg Patent, Plain Top	$3.50@3.75
Sewing, Brass Ferrule	$1.50@1.60
Saddlers', Brass Ferrule	$1.35@1.55
Peg, Common	$1.25@1.35
Brad, Common	$1.50@1.75

Halters and Ties—

Covert Mfg. Co., Web.....45&2%
Covert Mfg. Co., Jute Rope.....45&2%
Covert Mfg. Co., Sisal Rope.....30&2%
Covert's Saddlery Works', 96 list, ₩ lb 60&10
Covert's Saddlery Works, Leather 60&10%
Covert's Saddlery Works, Jute....60&5%
Covert's Saddlery Works, Sisal.....60%
Covert's Saddlery Works, Manila..60&5%
Covert's Saddlery Works, Cotton....70%

Hammers—

Handled Hammers—

Heller's Machinists'.....50&50&5%
Heller's Farriers.....50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40&10%
Peck, Stow & Wilcox.....40@40&10%
Fayette R. Plumb: Plumb, A. E. Nail.....40&10&7½%
Engineers' and B. S. Hand.....60&10&2½%
Machinists' Hammers.....60%
Riveting and Tinners'.....40&10&7½%
Sargent's C. S. New List.....45&10%

Heavy Hammers and Sledges—

3 lb. and under	*lb.* 45c
3 to 5 lb	*lb.* 36c
Over 5 lb	*lb.* 30c

80&10@80 &10&5%

Wilkinson's Smiths'.....9½c@10c lb.

Handcuffs and Leg Irons

See *Police Goods.*

Handles—

Agricultural Tool Handles—

Axe, Pick, &c.....60@60&10%
Hoe Rake, Fork, &c.....60@60&10%
Shovel, &c., Wood D Handle.50@50&5%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted.....*gro.* $2.50@2.50
Brad Awl.....*gro.* $1.25@1.50
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $3.25@3.35; *large,* $3.50@3.60.
Hickory Tanged Firmer, gro. ass'd. $1.75@2.20; *large,* $3.50@3.70.
Apple Socket Firmer, gro. ass'd, $1.70@1.85; *large,* $3.00@3.25
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; *large,* $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd. $2.50@3.75; *large,* $3.65@3.85
File, assorted.....*gro.* $1.60@1.15
Hammer, Hatchet, Axe, &c.....60%
Hand Saw, Varnished, doz. 70@75c
Not Varnished.....55@60c
Plane Handles:
Jack, doz. 25c; Jack Bolted..55@60c
Fore, doz. 35@38c; Fore, Bolted..70@75c

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Doz	$0.85	1.30	1.80	1.95	2.15

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch	3	4	5	6
Doz	$1.45	1.90	2.55	3.10

Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk Hanger Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.25
Parlor, New Model.....$2.75
Parlor New Champion.....$2.40
Barn Door, Standard.....60&10%
Covered.....50&10&10&5%
Special.....60&10%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
New York.....60%
Peerless.....60&10%
Sterling.....60%
McKinney Mfg. Co.:
No. 2, Standard, $18.....60&10%
No. 1, Special, $13.....60&10%
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing.....40%
Atlas.....50&10%
Badger Barn Door.....50%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator.....40%
Express.....50%
Interstate.....50&10%
Lundy Parlor Door.....50%
Matchless.....50&10%
Nansen.....60&10%
Stowell Parlor Door.....50%
Railroad.....50%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....40&15%
Wild West.....50%
Zenith for Wood Track.....50%
Taylor & Boggis Foundry Co.:
Kidder's.....50@50&10%
Van Wagoner & Williams Hdw Co.:
American Trackless.....33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....60%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing...40%
Wilcox Auditorium Ball Bearing.20%
Wilcox Barn Trolley No. 123.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox Trolley Ball Bearing....40%

Extra 5&10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—

McKinney's Perfect Hasp ₱ doz. 40&10%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—

Best Brands.....60@50&10%
Cheaper Brands.....60@60&10%
Note.—Net prices often made.

Hay and Straw Knives—See *Knives.*

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1858 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.45	2.90

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.60	.55	.52	.45

Mortise Reversible Shutter, (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.65	.60	.55

Parker.....70@75%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5.....66⅔&10%
Sargent's, Nos. 11 & 13.....70&10%
Wrightsville H'dware Co.:
O. S., Lull & Porter.....80&2½%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Stenger's Positive Locking, Nos. 1 & 3.....70&10&5%
Shepard's Noiseless, Nos. 60, 65, 55....70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&7½%
1868, Old Pat'n. Nos. 1, 3 & 5....75&7½%
Tip Pat'n, Nos. 1, 3 & 5.....75&7½%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&7½%
Shepard's Double Locking, Nos. 30 & 25.....70&10%
Champion Gravity Locking, No. 75....75&7½%
Steamboat Gravity Locking, No. 10....5&7½%
Pioneer, Nos. 660, 45 & 5½.....75&7½%
Empire, Nos. 101 & 103.....70&7½%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets $1.30.....30&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches	$1.90	2.50	3.25
Hinges only	1.30	1.90	2.90
Latches only	0.65	0.65	0.95

New England:
With Latch.....*doz*.....@$1.55
Without Latch.....*doz.*.....@$1.25
Reversible Self-Closing:
With Latch.....*doz.*.....@$1.80
Without Latch.....*doz.*.....@$1.45
Western:
With Latch.....*doz.* $1.60@1.75
Without Latch.....*doz.* $0.95@1.00
Wrightsville H'dware Co.:
Shepard's or Clark's, Nos 1 & 2..65&2½%
Shepard's or Clark's, No. 3.....55&5%

Extra 10% often given on most of these Hinges.

Spring Hinges—

Holdback, Cast Iron, gro. $8.00@8.25
Non-Holdback, Cast Iron, gro. $6.75@7.25

J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer's.....33⅓%
Chicago Spring Butt Co.:
Chicago.....20%
Floor Hinge.....40%
Garden City Engine House.....20%
Keene's Saloon Door.....20%
Triple End.....40%
Hoffman Hinge & Foundry Co.:
No. 20 & 30 Holdback Detachable $8.50
Lawson Mfg. Co.:
Marchi ss.....30%
Matchless Pivot.....35%
Payson Mfg. Co.:
Oblique.....50&10%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%
Van Wagoner & Williams Hdw. Co.:
Acme, Cast Steel.....30%
Acme, Brass.....20%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable.....30%
Gem, new list.....25%
Clover Leaf.....₱ gr. $12.50
Oxford new list.....25%

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges....75%
Heavy Strap Hinges...80%
Light T Hinges.....70%
Heavy T Hinges.....66⅔%
Extra Heavy T Hinges...75&10% } Extra 20@...%
Hinge Hasps.....60%
Cor. Heavy Strap.....80%
Cor. Ex. Heavy T...75&10%

Screw Hook and Strap:
6 to 12 in.....*lb.* 3 c
14 to 20 in.....*lb.* 2¾c
22 to 36 in.....*lb.* 2½c

Screw Hook and Eye:
¾ to 1 inch.....*lb* 5 c
⅝-inch.....*lb.* 6 c
½-inch.....*lb.* 7 c

Miscellaneous—

Hoffman's Steel Spring Butt Hinges....40&10%
Hoffman's Offset Refrigerator Hinges..40&10%

Hods, Coal—

Gal. Open	15	16	17	18 *inch.*
	$2.10	2.55	2.80	3.15 ₱ doz.
Jap. Open	$1.60	1.85	2.10	2.40 ₱ doz.
Galv. Fun'el	2.65	5.05	5.35	5.65 ₱ doz.
Jap. Funnel	$2.10	2.45	2.65	2.90 ₱ doz.

Hoes—Eye—

Scovil and Oval Pattern.....60¢5@60¢10¢5%
Grub, list Feb. 23, 1899..70¢5@70¢10%
D. & H. Scovil.....35%

Handled—

Sept. 1, 1900, List:
Field and Garden.....75¢2%
Ladies', Boys', Toy and Onion...70¢10¢10%
Street and Mortar.....75¢7½¢2%
Cotton.....70¢10¢10¢5¢2%
Planters'.....70&30%
Weeding.....75%
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe.....75&2%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10&2%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $4.50
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy, per doz....75&2%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2%
B. B. Cultivator Hoe.....75&10%
Acme Weeding.....75&10%
W. & C. Lightning Shuffle Hoe, ₱ doz. $5.50

Hog Rings and Ringers—See *Rings and Ringers.*

Hoisting Apparatus—See *Machines, Hoisting.*

Hollow Ware—See *Ware, Hollow.*

Holders—Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%

File and Tool—

C. E. Jennings & Co. Model Tool Holders.....33⅓%
Nicholson File Holders and File Handles.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....
Bird Cage, Sargent's List..... } 50&10@60%
Clothes Line, Hoffman's.....40&10%
Clothes Line, Sargent's List.50&10&2&10%
Ceiling, Sargent's List.....40&10%
Clothes Line, Stowell's.....70%
Clothes Line, Reading List.....65&10@65&10&10%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Sargent's List.....45&10%
Coat and Hat, Wrightsville.....65&10%
Harness, Reading List.....70&10@75%

Wire—

Belt.....80%
Wire C. & H. Hooks..60¢10@60¢10¢5%
Atlas, Coat and Hat:
Single Cases.....45%
10 Case Lots.....45&10%
Czar Harness.....50&10&5%
Wire Coat and Hat:
Acme.....60%
B. B.....60%
V Brace, Chief and Czar.....60%
Gem.....60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in, per doz. $1.50; 8 in., $1.75; 10 in., $2.00.
Cotton.....*doz.* $1.05@1.25
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50

Grass.....*Nos.*	1	2	3	4
Best	$1.50	1.75	2.00	
Common	$1.30	1.50	1.50	1.60

Potato and Manure.....70%
Whiffletree.....*lb.* 4¾c
Hooks and Eyes:
Brass.....60¢10¢10@70%
Malleable Iron.....70¢5@70¢10%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60&10%
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:

Competition.....*ft.*	4¼@	4¾c
3-ply Standard.....*ft.*	5 @	6 c
4-ply Standard.....*ft.*	8 @	9 c
5-ply extra.....*ft.*	9 @	10 c
4-ply extra.....*ft.*	11 @	12 c

Cotton Garden, ¾-in., coupled:
Low Grade.....*ft.* 6 @7 c
Fair quality.....*ft.* 8 @9 c

Irons—Sad—

From 4 to 10.....*lb* 3@3¼c
B. B. Sad Irons.....*lb.* 3½@4c
Chinese Laundry.....*lb.* 5@5¼c
Chinese Sad.....*lb.* 3½@3¼c
Mrs. Potts', per set:

Nos.	50	55	60	65
	67@72c	64@69c	77@82c	71@79c

New England Pressing, lb...3½@3¼c

Soldering—

Soldering Coppers, 1 & 1¼ lb., 21 @ 22c.; 2 lb., 19 @ 21c
Covert Mfg. Co.....20&2%
Smith & Hemenway Co's Sets.....75%

Pinking—

Pinking Irons.....*doz.* 50@60c

Jack Screws—See *Screws.*

Jacks, Wagon—

Covert Mfg. Co., Steel.....45&2%
Daisy.....70%
Lockport.....40@40&10%
Victor.....60%
Lane's Steel.....33⅓&5%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.—

Dick's Butcher Knives.....40%
Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Ft. Madison Cut-Easy, ₱ doz.....$3.35
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....70&5@70¢10%
Adjustable Handle.....25@33⅓%
Bradley's.....35%
C. E. Jennings & Co. Nos. 45, 46..40&10%
Jennings & Griffin.....60&5%
Swan's.....70&10&2½%
Watrous.....30&10@40%
L. & I. J. White.....20&5&25%
Cantelo's Folding.....50@50&5%

Hay and Straw—

Lightning Pattern, per doz $6.25@6.50
Iwan's Sickle Edge.....₱ doz. $10.00
Iwan's Serrated.....₱ doz., $10.00
Maine.....₱ doz., $8.50

Mincing—

Buffalo.....₱ gro. $15.00

Miscellaneous—

Farriers'.....*doz.* $2.00@3.00
Wos enholm's.....₱ dos. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro.....$1.20@1.30
Carriage, Jap, all sizes..*gro.* 30@33c
Door, Mineral.....*doz.* 60@65c
Door, Por. Jap'd.....*doz.* 70@75c
Door, Por. Nickel....*doz.* $2.00@2.10
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's.....60&10%
Snow's Victor.....50&10%

Ladders, Step—

Handy Ladder Works:

Length. Feet.	Extended Length. Feet.	Shipped Ready for Use	Per doz.	Shipped K. D., Per doz.
4	7	$16.00		$14.00
5	9	19.50		17.00
6	11	24.50		21.00
7	13	29.50		25.00
8	15	34.00		29.00
9	17	39.00		32.00
10	19	43.00		35.00
11	21	46.50		40.00
12	23	51.00		45.00

Ladles—Melting—

L. & G. Mfg. Co. 60%
P., S. & W. ..... 40@40&10%
Reading ..... 50&10%
Sargent's ..... 40@40&10%

Lanterns—Tubular—

Regular Tubular ..... *doz. $4.50@5.60*
Side Lift Tubular ..... *doz. $4.75@5.25*
Square Lift Tubular ..... *doz. $4.75@5.25*
Other Styles ..... *40@10@40@10@5%*

Bull's Eye Police—

No. 1, 2¾ inch *$3.60*
No. 2, 3 inch *$4.00*

Latches, Thumb—

Roggin's Latches ..... *doz. 32@33c*

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Small ..... *doz. 50c; large. 55c*
Covert Mfg. Co. ..... 45&2%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Solid Grip, Payson Mfg. Co. 80%
R. & E. 45%

Lines—

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet	*$2.20*	*1.90*	*1.65*
75 feet	*$1.80*	*1.70*	*1.30*

Onawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 8 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gr. 30%

Locks—

Cabinet—

Cabinet Locks ..... *33⅓@33⅓&2⅓%*

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]

Reading Hardware Co. 40%
R. & E. Mfg. Co. 50%
Sargent & Co. ..... 40@40&10%
Snow's Victor ..... 50&10%

Elevator—

Stowell's 33⅓%

Padlocks—

Wrought Iron ..... *80@80&10%*
R. & E. Mfg. Co. Wrt Steel and Brass. 50%

Sash, &c.—

Fitch's Bronze and Brass 66⅔%
Fitch's Iron 70%
Ives' Patent ..... 55&5@65%
Payson's Signal 80%
Reading ..... 60&10&10@70%

Machines—

Boring—

	Without Augers. Upright.	Angular.
Improved No. 3	$4.25	No. 1 $5.00
Improved No. 4	3.75	No. 2 3.38
Improved No. 5	2.75	
Jennings'	2.50	3.00
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75
Swan's, No. 500	5.10	No. 200 6.45

Hoisting—

Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%

Ice Cutting—

Chandler's 15%

Washing—

Wayne American, ₩ doz. $28.00
Western Star, No. 2, ₩ doz. 28.00
Western Star, No. 3, ₩ doz. 30.00
St. Louis, No. 41, ₩ doz. 60.00
} Carload lots 10% off, freight allowed.

Mallets—

Hickory ..... *45&5@50&5%*
Lignumvitæ ..... *45&5@50&5%*
Tinners', Hickory and Applewood, doz. ..... *50@55c*

Mats—

Door—

Elastic Steel (W. G. Co.) 10%

Mattocks—

See *Picks and Mattocks.*

Meat Cutters—

See *Cutters, Meat.*

Milk Cans—See *Cans, Milk*

Mills—Coffee—

Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor ..... 50&10@60%
Parker's Box and Side ..... 50&10&10%
Swift, Lane Bros. 30%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Net prices are generally quoted.
Cheap ..... *all sizes, $1.80@2.10*
Good ..... *all sizes, $2.50@2.75*

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Pennsylvania and Continental. 60&10&5%
Quaker City ..... 70&5%
Great American ..... 70&5%
Philadelphia:
Styles M., S., C., K., T. ..... 70&5%
Style A, all Steel ..... 60&10%
Style E, Low Wheel ..... 60&10%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list ... 50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899 ..... *85@85&10%*
Hungarian, Finishing, Upholsterers', &c. See Tacks

Horse—

Nos.	6	7	8	9	10	
A. C.	25¢	23¢	22¢	21¢	21¢	40&5%
Ausable	28¢	26¢	25¢	24¢	23¢	50&10%
Capewell	19¢	18¢	17¢	16¢	16¢	10&5%
C. B. K.	25¢	25¢	22¢	21¢	21¢	40%
Champ'n	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton	19¢	17¢	16¢	15¢	14¢	30&10&5%
Maud S.	25¢	23¢	22¢	21¢	21¢	50%
Neponset	23¢	21¢	20¢	19¢	18¢	40%
Putnam	23¢	21¢	20¢	19¢	18¢	33⅓%
Vulcan	23¢	21¢	20¢	19¢	18¢	25&10%

American, Nos. 5 to 16 ₩ lb. ..... 9@9½¢
Jobbers' special brands, per lb. 8@9c

Picture

	1½	2	2½	3	3½ in.
Brass Head	*.55*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Nippers, See *Pliers and Nippers.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—

Cold Punched — *Off*
Mfrs. or U. S. Standard. — *list.*
Hexagon, plain *5.80c*
Square, plain *5.40c*
Square, C. T. & R. *5.60c*
Hexagon, C. T. & R. *6.30c*
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank or Tapped *5 60c*
Hexagon Blank or Tap'd *6.30c*

Oakum—

Best or Government ..... *lb. 6½c*
Navy ..... *lb. 5 c*
U. S. Navy ..... *lb. 5½c*
Plumbers' Spun Oakum *5¾c*
In carload lots ¼c lb. off f. o. b. New York.

Oil, Axle—

Snow Flake:
1 pt. cans, per doz. $3.00
1 qt. cans, per doz $4.80
1 gal. cans, per doz. $15 00
5 gal. cans, per doz. $66.00
} 33⅓&10%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper ..... *40&10@50%*
Tin or Steel ..... *60¢10@65%*
Zinc ..... *60¢10@65%*
Paragon:
Brass and Copper ..... *40¢10%*
Tin or Steel ..... *60¢10%*
Zinc ..... *60¢10%*
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc. ..... 60@60&10%

Oponers—Can—

French ..... *doz. 35c*
Iron Handle ..... *doz. 25@27c*
Sprague, Iron Hdle ..... *per doz. 35@40c*
Sardine Scissors ..... *doz. $1.75@$3.00*
Tip Cap ..... per doz. $0.75
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 40@45
Waldorf, ₩ gro. $9.00

Egg—

Nickel Plate ..... per doz., $2.00
Silver Plate ..... per doz., $4.00

Packing—

Rubber—

Standard, fair quality ..... *70&10@75%*
Inferior quality ..... *75&10@80%*
Extra ..... *60&5@60&10&5%*
Jenkins' Standard, ₩ lb 80¢ ..... 25@25&5%

Miscellaneous—

American Packing ..... *9@10c lb.*
Cotton Packing ..... *13@15c lb.*
Italian Packing ..... *10½@11¼c lb.*
Jute ..... *3½@5c lb.*
Russia Packing ..... *12@13c lb.*

Pails—

Creamery—

S. S. & Co., with gauges. No 1 $6.50; No. 2, $5.75 ₩ doz.

Galvanized—

Price per gro.

Quart	*10*	*12*	*14*
Water, Regular	*18 00*	*21.00*	*24.00*
Water, Heavy	*24.00*	*27.00*	*30.00*
Fire, Rd. Bottom	*31.00*	*33.00*	*35.00*
Well	*27.00*	*29.00*	*31.00*

Pans—Dripping—

Standard List ..... *60¢5@60&10¢5%*

Fry—

Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.60*	*.75*	*.85*	*.95*	*1.15*

Roasting and Baking—

Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.00; 20, $5.50; 30, $6.00
Simplex, ₩ gro., No. 40 $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37.50; 160, $43.00.

Paper—

Building Paper—

	Per roll
Rosin Sized Sheathing:	*500 sq. ft.*
Light wt., 20 sq. ft. to lb.	*$0.35*
Medium wt., 12 sq. ft. to lb.	*$0.56*
Heavy wt., extra quality.	*$0.85@0.90*
Medium Grades Water Proof Sheathing	*$0.65@1.25*
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton	*$36.00@37.00*

Tarred Paper.

1 ply (roll 400 sq. ft.), ton *$26 00*
2 ply, roll 100 sq. ft. *50c*
3 ply, roll 100 sq. ft. *70c*

Sand and Emery—

List Dec. 23, 1899 ..... *50¢10@50¢10¢10%*

Parers—

Apple—

Advance	₩ doz.	$4.50
Baldwin	₩ doz.	$5.00
Bonanza	each	$5.00
Dandy	each	$7.50
Eureka, 1898	each	$16.00
Family Bay State	₩ doz.	$12.00
Hudson's Little Star	₩ doz.	$4.00
Hudson's Rocking Table	₩ doz	$5.50
Improved Bay State	₩ doz.	$27.00@30.00
New Lightning	₩ doz.	$5.50
Reading 72	₩ doz.	$4.00
Reading 78	₩ doz.	$7.00
Turn Table '98	₩ doz.	$5.50
White Mountain	₩ doz.	$4.00

Potato—

Saratoga	₩ doz.	$5.50
White Mountain	₩ doz.	$4.50

Paris Green— *per lb.*

In Arsenic kegs or casks *12½c*
In kegs, 100 to 175 lbs. ..... *13 c*
In kits, 14, 28, 56 lbs. ..... *14 c*
In paper boxes, 2 to 5 lbs. ..... *14 c*
In paper boxes, 1 lb. *14½c*
In paper boxes, ½ lb. *15½c*
In paper boxes, ¼ lb. *16½c*

Picks and Mattocks—

List Feb. 23, 1899 ..... *70¢10@70¢10¢5%*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Escutcheon—

Brass ..... *60¢10%*
Iron, list Nov 11, '85 ..... *60¢10%*

Pipe, Cast Iron Soil—

Factory Shipments—Carload lots.

Standard, 2-6 in. ..... *65¢ %*
Extra Heavy, 2-6 in. ..... *70¢10%*
Fittings ..... *75¢10¢5%*
NOTE.—*Freight allowed on Carload lots.*

Pipe, Merchant, Boiler Tubes, &c.—

Carloads to Consumers.

Merchant Pipe.

	Black.	*Galvanized*
⅛ to ¼ inch	61%	48%
¾ to 10 inch	68½%	56%

Boiler Tubes

Steel.	*Up to 22 feet.*	*22 feet and over.*
1 to 1¼ inch and 2¼ in.	*49½&*	*44½&*
1¾ to 2¼ inch	*45%*	*39½%*
2¾ to 13 inch	*57%*	*52½%*
Iron.		
1 to 1¼ inch and 2¼ in.	*49½&*	*44½&*
1¾ to 2¼ inch	*45%*	*39½%*
2¾ to 13 inch	*57%*	*52½%*

Casing, Cut Lengths. — *S. & S.*

3 to 8 inch *58%*
8½ to 4 inch *63%*
4½ to 12½ inch *65%*
NOTE.—*The old list is still used by some jobbers, and net prices are often quoted.*

Planes and Plane Irons—

Wood Planes—

Molding ..... *40¢2½@40¢10%*
Bench, First quality ..... *45¢10@45¢10¢5%*
Bench, Second quality ..... *50¢10@50¢10¢5%*
Bailey's (Stanley R. & L. Co) ..... 50&10@50&10&10%
Gage Self Setting 35%

Iron Planes—

Bailey's (Stanley R. & L. Co) ..... 50&10@50&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10@25&10&10%
Sargent's ..... 50&10&10%

Plane Irons—

Wood Bench Plane Irons ..... *30¢5@30¢10¢5%*
Buck Bros. 30%
Butcher's ..... $5.00@5.25 to £
Stanley R. & L. Co. ..... 50&10@50&10&10%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse ..... ₩ doz. $9.00

Plates—

Felloe ..... *lb. 3¾@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $3.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... *70¢10@75%*
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe .. 7 — 8 — 10 — 12-in.
$1.75 — $2.00 — $2.75 — $3.75
Acme Nippers ..... 40@40&5%
Bernard's:
Parallel Pliers, &c. 35%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 50&5%
Elm City Fence Pliers 35%
Cronk Hanger Co.:
Cronk's 60%
Improved Button ..... 70&5%
Stub's Pattern 50%
Combination and others 25%
Heller's Farriers' Nippers, Pincers, and Tools 50@50&5%
Morrill's Parallel, ₩ doz. $12.00 ... 30&5%
P., S. & W. Cast Steel ..... 30&10@40%
P., S. & W. Tinners' Cutting Nippers, 40@40&5%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Plumbs and Levels ..... *75@75¢10%*
Davis Iron, Machinist Nos. 1 to 14 ... 30%
Davis Iron, Adjustable Nos. 6 to 49 ... 35%
Disston's 70%
Pocket Levels ..... 75&10&10@75&10%
Stanley R. & L. Co ..... 70&10@70&10&10%
Stanley's Duplex ..... 25&10@25&10&10%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Claziers'—

Bulk and 1 lb. papers .. *lb. 8 @ 8¼c*
½-lb. papers ..... *lb. 8¼@ 8¾c*
¼-lb. papers ..... *lb. 8¾@ 8¾c*

Pokes, Animal—

Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

Police Goods—

Manufacturers' Lists ..... *25@25&5%*
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (¼ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.72 ..... 40%
Prestoline Paste ..... 33⅓@40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ lb boxes, ₩ doz. $1.25; 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₩ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans .. ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans ..... ₩ doz. 75¢
Black Jack Paste, ¾ lb cans. ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ lb 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ½ pt. cans ..... ₩ doz. $1.50
Wynn's Black Silk, 5 lb pail ... each 70¢
Wynn's Black Silk, ½ lb box, ₩ doz. $1.00
Wynn's Black Silk, 5 oz. box, ₩ doz. $0.75
Wynn's Black Silk, ½ pt. liq., ₩ doz. $2.00

Poppers, Corn—

Round or Square:
1 qt. ..... *gro. $6.50@$7.00*
1½ qt. ..... *gro. 9 50@ 10 00*
2 qt. ..... *gro. 10.50@ 11.00*

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Enameled *45%*
Tinned *40%*

Powder—

In Canisters:
Duck, 1 lb. each *45c*
Fine Sporting, 1 lb each *75c*
Rifle, ½-lb. each *15c*
Rifle, 1-lb. each *25c*
In Kegs:
Duck, 6½-lb. kegs *$2.25*
Duck, 12½-lb. kegs *$4.25*
Duck, 25-lb kegs *$8.00*
Rifle, 6¼-lb kegs *$1.25*
Rifle, 12½-lb. kegs *$2.25*
Rifle, 25-lb. kegs *$4.00*
King's Smokeless Shot Gun and Rifle: Keg (25 lb bulk) $22 00
Half Keg (12½ lb bulk) $11.25
Quarter Keg (6¼ lb bulk) $5.75
Canister (1 lb bulk) $1.00
} 20&2½&10%
King's Semi-Smokeless: Keg (25 lb bulk) $16.00
Half Keg (12½ lb bulk) $8.25
Quarter Keg (6¼ lb bulk) $2.75
One Pound Can, bulk $0.50
} 20&2½&10%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 30@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Crown, ₩ doz. $18.00 ..... 50%
Crown Prince, ₩ doz. $15.00 ..... 50%
Cyclops ..... 40@40&10%
Diamond B, No. 2, doz. $22.; No. 3, $11 ..... 40%
Eureka, 5 lb, doz., $16.00; 3 lb $15 ... 40%
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Miller's Falls, No. 3, per doz. $12.00 ..... 15&10%
Pelican ₩ doz. $9.00 ..... 40&10%
Scranton, No. 1 and 2, ₩ doz. $9.00
Scranton, No. 3, ₩ doz. $8.50

Pulleys—

Hay Fork, Swivel or Solid Eye ..... *doz. $1.35@1.50*
Hot House, Awning, &c. ..... 60@60&10%
Japanned Clothes Line ..... 60@60&10%
Japanned Screw ..... 70&10&10%
Japanned Side ..... 70&10&10%
Stowell's Ceiling or End, Anti-Friction 60%
Stowell's Dumb Waiter, Anti-Friction .. 60&10%

Bay Fork, Stowell's Anti-Friction, 5-in. Wheel, ₩ doz. $12.00 ..... 40%
Stowell's Electric Light 60%
Stowell's Side, Anti-Friction ..... 60&10%

Sash Pulleys—

Acme ..... 1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₩ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 6 and 7, 2¼ in. ..... ₩ doz. 25¢
No. 9, 1¾ in. ..... ₩ doz. 20¢
Extra for Plated Finish ..... ₩ doz. 20¢
Extra for Anti-Friction Bronze Bushing ..... ₩ doz 10¢
Grand Rapids All Steel Noiseless 40%
Ideal No. 13 ..... 1¾ in., ₩ doz., 20¢
Niagara ..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy ..... 1¾ in., 14½¢; 2 in., 16½¢
Star ..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern ..... 60&10@60&10&10%
Pitcher Spout 80%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch..	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Barnes Dbl. Acting (low list) .. 55%
Flint & Walling's Fast Mail ..... 55@55&10%
Flint & Walling's Pitcher Spout ..... 75&5%
Loud's Suction Pumps, U. S. Co 20%
Myer's Pumps, low list 50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co 20%

Punches—

Revolving (4 tubes)...doz. $3.50@3.75
Saddlers' or Drive, good..doz. 65@70c
Spring, good quality ..... $1.65@1.75
Bemis & Call Co.'s Cast Steel Drive 50%
Bemis & Call Co.'s Check 55%
Bemis & Call Co.'s Spring 50%
Niagara Hollow Punches 45%
Niagara Solid Punches 55%
Steel Screw, B & K. Mfg. Co 40%
Tinners' Hollow, P., S. & W. Co ..... 35@35&5%
Tinners' Solid, P., S. & W.Co., ₩ doz., $1.44 ..... 55%

Rail— Barn Door, &c.—

Barn Door, Light.. ½ ⅝ ¾ 1 in.

100 feet	$2.00	$2.50	$3.00	$3.50

B. D., for N. E. Hangers:

	Small.	Med.	Large.
100 feet	$2 20	2.70	3.20

Sliding Door, Bronzed Wr't Iron, ft. 6½¢
Sliding Door, Iron Painted ..... 2½@3¢
Sliding Door, Wrought Brass, 1¼ in. ..... lb. 35¢..30%
Cronk's Double Braced Steel Rail, ₩ foot ..... 3½¢
Cronk's O. N. T. Rail ..... 3½¢
Lanes' O. N. T., ₩ 100 ft., 1 inch $2.65
Lanes' Standard, ₩ 100 ft 3.70
Lawrence Bros.' ..... ₩ ft. 4½¢
McKinney's None Better ..... ₩ ft. 3¢
McKinney's Standard ..... ₩ ft. 3½¢
Moore's Wr't. Bracket, Steel ..... 3½¢
Stowell's Cast Rail ..... 1½¢
Stowell's Steel Rail, Plain 2½
Stowell's Wrought Bracket, Plain ..... 3½¢

Rakes—

Net Prices, Malleable Rakes:

	10	12	14	16-tooth
Shank	$1.50	1.60	1.75	1.85
Socket	$1.65	1.80	1.95	2.10

Sept. 1, 1900, List:
Cast Steel ..... 70@5&2½
Malleable ..... 70@10@75@5%
Lawn Rakes, Metal Head, per doz.,
20 teeth ..... $3.55@3 60
24 teeth ..... $3.60@3 75
Fort Madison Red Head Lawn $3 25
Fort Madison Blue Head Lawn $3.00
Jackson Lawn, 29 and 30 teeth ..... ₩ doz. $4.50
Kohler's Lawn Queen, 24-tooth, ₩ doz. $3.75
Kohler's Paragon, 24-tooth, ₩ doz. $3.00
Kohler's Steel Garden, 14-tooth, ₩ doz. $3.50
Kohler's Malleable Garden, 14-tooth, ₩ doz. $2.50

Rasps, Horse—

Disston's 75%
Heller Bros. ..... 60&10&10%
McCaffrey File Co. Horse Rasps ..... 60&10&5%
New Nicholson Horse Rasp ..... 70&10%
See also *Files.*

Razors—

Fox Razors, No. 42... ₩ doz. $20.00
Fox Razors, No 44... ₩ doz. $24.00
Fox Razors, No. 89, Platina, ₩ doz $24.00
} dis. 40%
Sterling Razor Works 50%

Razor Strops—

See *Strops, Razor.*

Reels— Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes 25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor. 50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2004P and PN, 002904PN, 0924 and 0924N, 5009N and PN ..... 40&10%
Shakespeare, Style C 25%

Registers—

Black Jap ..... 60@60&10%
White Jap ..... 40&10@50%
Bronzed ..... 40&10@50%
Nickel Plated ..... 40&10@60%
Electro Plated ..... 40&10@...%

Revolvers—

Single Action ..... 80@85¢
Double Action $1 35
Automatic $2.75
Hammerless $3.25

Riddles, Grain or Sand—

16 in. per doz ..... $3.00@$3.25
17 in. per doz ..... $3.25@$3.50
18 in. per doz ..... $3.50@$3.75

Rings and Ringers—

Bull Rings—

	2	2½	3 Inch.
Steel	$0 80	0.90	0.95 doz.
Copper	1.10	1.50	1.80 doz.

Hog Rings and Ringers—

Hill's Rings...gro. boxes, $4.50@4.75
Hill's Ringers, Gray Iron doz. 55@60c
Hill's Ringers, Mal. Iron, per doz 75@80c
Blair's Rings...per gro. $5.75@6.00
Blair's Ringers...per doz. $0.90@1.00
Brown's Rings...per gro. $6.00@6.25
Brown's Ringers..per doz. $1.00@1.10
Rapid Rings ..... ₩ gro. $6.00
Rapid Ringers ..... ₩ doz. $3.50

Rivets and Burrs—

Copper ..... 60@50&5%
Iron or Steel:
Tinners' ..... 70@70&10%
Miscellaneous ..... 70@70&10%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list ..... 50&10&10%
Cronk's Stay ..... 60&5%
Cronk's Brinkerhoff 66⅔
Lane's Stay 33½%
Stowell's Barn Door Stay... ₩ doz. $1.25

Rope—

Manila, 7-16 in. and larger. lb. 10½@10¾¢
Manila ..... ¾-inch lb. 11 @11¼¢
Manila ¼ & 5-16 in. lb. 11¾@11¾¢
Manila, Tarred Rope, 15 thread ..... lb. 10½@10¾¢
Manila Hay Rope. Medium ..... lb 10½@10¾¢
Sisal, 7-16 in. and larger ..... lb. 7½@ 7¾¢
Sisal ..... ¾-inch. lb. 7¾@ 8 c
Sisal ¼ and 5-16 in. lb. 8¼@ 8½¢
Sisal, Hay Rope, 2 to 10 ply ..... lb. 7¼@ 7¾¢
Sisal, Tarred, Medium Lath Yarn ..... lb. 6¾@ 7 c
Cotton Rope:
Best ..¼-in. and larger lb. 14 c
Midium, ¼-in. and larger lb. 11¼c
Com., ¼-in. and larger lb. 9 c
Jute Rope, No. 1, ¼ in. and up ..... lb. 6¼c
Jute Rope, No. 2, ¼-in. and up ..... lb. 6 c

¼cles in good lots.

Wire Rope—

Galvanized ..... 25&7½%
Plain ..... 30&7½%

Ropes, Hammock—

Covert Mfg. Co ..... 45&2%
Covert Saddlery Works 60%

Rules—

Boxwood..75&10&10&10&10@75&10 &10&10&10&5%
Ivory ...40&10&10@40&10&10&10&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Stanley R. & L. Co.:
Boxwood...75&10&10@75&10&10&10%
Ivory ..... 35&10@35&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins' Circular ..... 50@50&10%
Atkins' Band ..... 50&10@60%
Atkins' Cross Cuts ..... 35&5%
Atkins' Mulay, Mill and Drag ..... 50&10%
Atkins' One-Man Saw 40%
Atkins' Wood Saws 40%
Atkins' Hand, Compass, &c 40%
Disston's Circular Solid and Inserted Tooth 50%
Disston Band 2 to 14 in. wide 60%
Disston Band ¼ to 1¼ 70%
Disston Crosscuts ..... 45&10%
Disston Narrow Crosscuts ..... 50@50&10%
Disston Mulay, Mill and Drag 50%
Disston Framed Woodsaws ..... 35@35&7½%
Disston Woodsaw Blades ..... 40@40&7½%
Disston Woodsaw Rods 25%
Disston Handsaws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25@25&7½%
Disston Hand Saws, Nos. 7, 107, 107 3, 1, 0, 00, Combination ..... 30@30&7½%
Disston Compass Keyhole &c 25@25&7½%
Disston Butcher Saws and Blades ..... 35@35&7½%

C. E. Jennings & Co.'s:

Back Saws 25%
Butcher Saws 35%
Compass and Key Hole Saws 25%
Framed Wood Saws 40%
Hand Saws ..... 25@30%
Wood Saw Blades 45%
Peace Circular and Mill 50%
Peace Cross Cuts, list Jan. 1, '99 ..... 50%
Peace Hand, Panel and Rip 30%
Richardson's Circular and Mill 50%
Richardson's X Cuts, list Jan. 1, '99 ..... 50%
Richardson's Hand, &c 30%
Simonds' Circular Saws 50%
Simonds' Crescent Ground Cross Cut Saws 25%
Simonds' One-Man Cross Cuts ..... 40&10%
Simonds' Gang Mill, Mulay and Drag Saws ..... 45@45&5%

Hack Saws—

Disston Concave Blades 35%
Disston Keystone 30%
Disston Hack Saw Frames 50%

C. E. Jennings & Co's:
Hack Saw Frames, Nos. 175, 180, 330 ..... 40%
Hack Saws, Nos. 175, 180, 330, complete 40%
Griffin's Hack Saw Frames 45%
Griffin's Hack Saw Blades 45%
Star Hack Saws and Blades ..... 15&10%

Scroll—

Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $15; with boring attachment, $20 ..... 30%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scale Beams—

See *Beams, Scale.*

Scales—

Family, Turnbull's ..... 30@30&10%
Hatch, Counter:
Platform, 4 lb. by ¼ oz...doz. $5.75
Two Platforms, 8 lb. by ½ oz..... doz. $16 00
Union Platform, Plain ..... $1.70@1.90
Union Platform, Striped ..... $1 85@2 15
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Chatillon's Grocers' Trip Scales 50%
Pelouze Scales—Household, Counter Confectionery, Postal, Ice, &c 50%
"The Standard" Portables 45%
"The Standard" R. R. and Wagon 50%

Scrapers—

Box. 1 Handle ..... *doz $2.25@2.50*
Box. 2 Handle ..... *doz. $3.75@4.00*
Ship, No. 1, doz. $3.50; No 2, ... $2.25@2.40
Adjustable Box Scraper (S. R. & L. Co.) $6.00 ..... 30&10%

Screens, Window and Frames—

Bonanza Window Screens ..... 60@60&5%
Fiyer Pattern Window Screen. 60@60&5%
Maine Window Screen Frames 40&10&5%
Perfection Window Screens ..... 60@60&5%
Phillips' Window Screen Frames ..... 60&10&5%
Porter's Extension Window Screens.. 50&10%
Wabash Spring Adj. Screen 50%

Screw Drivers—

See *Drivers, Screw.*

Screws—

Bench and Hand—

Bench, Iron..doz. 1 in., $3.00@3.25; 1¼, $3.50@3.75; 1½, $4.00@4.50
Bench, Wood, Beech..doz. $3.50@3.75
Hand, Wood ..... 30&5@40%
Hand, R. Bliss Mfg. Co 35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99 ..... 75&15@...%
Coach and Lag, Gimlet Point, list Oct. 1, '99 ..... 75&10@...%
Hand Rail, list Jan. 1, '81.60&10@...%

Jack Screws—

Standard List ..... 75@75&10%
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W ..... 40&5@40&10%
Sargent ..... 70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron. 50&10@60%
Flat or Round Head, Brass ..... 50&10@60%

Set and Cap—

Set (Iron or Steel) ..... 70&10%
Sq. Hd. Cap ..... 65&10%
Hex. Hd. Cap ..... 65&10%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts:
Flat Head, Iron ..... 87½@90%
Round Head, Iron ..... 85@87½%
Flat Head, Brass ..... 85@87½%
Round Head, Brass ..... 82½@85%
Flat Head, Bronze ..... 75@80%
Round Head, Bronze ..... 72½@77½%
Drive Screws ..... 87½@90%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grass Scythes:
Natural Finish ..... per doz. $7.25
Polished Blade ..... per doz. $7.75
Painted or Bronzed..per doz. $7.50
Weed and Bush..per doz. $7.25@7.50

Scythe Snaths—

See *Snaths, Scythe.*

Seeders—

Raisin—

Enterprise ..... 25@30%

Sets—

Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2 25
Wood Hdle., 14 Awls, 6 Tools ..... doz. $2.50@2.60
Aiken's Sets, Awl and Tools: No. 20, ₩ doz. $10.00 ..... 50&10&10%
Fray's Adj. Tool H dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior: No. 1, $7.50; No. 2 $4.00; No. 3, $5.50 ..... 30&10@30&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe ..... ₩ doz. $9.00

Nail—

Square ..... per gro. $2 50
Round, Blk. and Pol., assorted ..... gro. $1.80@2.50
Octagon ..... gro. $4.25@4.75
Knurled, Good ..... gro. $6.00@6.50
Buck Brothers 27½%
Cannon's Diamond Point, ₩ gr. $13.. 25%
Snell's Corrugated, Cup Pt 50%
Snell's Knurled, Cup Pt 66⅔%

Rivet—

Regular list ..... 70@70&10&5%

Saw—

Aiken's Genuine ..... ₩ doz. $5.50@6.00
Aiken's Imitation ..... ₩ doz. $3.00@3.10
Atkin's Criterion 40%
Atkin's Adjustable 40%
Bemis & Call Co.'s Cross Cut 30%
Bemis & Call Co.'s Plate 20%
Bemis & Call Spring Hammer 30%
Disston's Star and Monarch 25%
Hammer, Bemis & Call Co.'s new Pat. 45%
Morrill's No. 1, $15.00 ..... 40&20%
Nos. 3 and 4, Cross Cut, $23.00. 40&20%
No. 5, Mill, $31.00 ..... 40&20%
No. 10, $15.50 ..... 40&20%
No. 11, $16.00 ..... 40&20%
Taintor Positive, ₩ doz. $18 ..... 60%

Sharpeners Knife—

Chicago Wheel & Mfg. Co ..... 50@65%
Smith & Hemenway Co ..... 70&5%
Tanite Mills ₩ gross, $14.40... 25@33⅓%

Sharpeners, Skate—

Eureka Skate Sharpener ..... ₩ doz. $2.00

Shaves Spoke—

Iron ..... doz. $1 00@1 25
Wood ..... doz. $1.75@2.00
Bailey's (Stanley R. & L. Co.) ..... 50&10%
Goodell's, ₩ doz. $9.00 ..... 15&10%

Shears—

Cast Iron	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17 00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality, Jap ....70@70&10%
" Nickel ..... 60@60&10%
Fair qual. Jap ..... 30@30&5%
" Nickel ..... 75@75&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailors' Shears ..... 40@40&5%
Wilkinson's Hedge 50%
Wilkinson's Sheep ..... 1900 list, 50%

Tinners' Snips—

Steel Blades ..... 20&10%
Steel Laid Blades ..... 40&10%
Forged Handles, Steel Blades, Berlin .. 40&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch 50%
Niagara Snips 40%

Pruning Shears and Tools—

Cronk's Pruning Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00 ..... 25@35&10%
Disston's Pruning Hook, ₩ doz. $12.00 ..... 25@35&10%
John T. Henry Mfg. Company Pruning Shears, all grades ..... 50&5%
Orange Shears ..... 50&30%
Grape ..... 50&10%
Tree Pruners 75%
Nagley's Pruning Shears ..... 10&5%
P., S. & W. Co ..... 33⅓@33⅓&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Patent Roller Hatfield's, Sargent's list, 80&10@80&10&7½
Reading ..... 70&10@75%
R. & E. list 33⅓%
Wrightsville, Hatfield Pattern 80%

Sliding Shutter—

Reading list ..... 70&10@75%
R. & E. list 33⅓%
Sargent's list ..... 50&10%&10%

Shells—

Shells, Empty—

Brass Shells, Empty: First quality, all gauges ..... 60&5%
Climax, Club, Rival, 10 and 12 gauge. 60&5%
Paper Shells, Empty: Acme, Ideal, Leader, New Rapid, Smokeless, 10, 12, 16 and 20 gauge. 33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge 15%
Climax, Club, League, Rival, 14, 16 and 20 gauge ($7.50 list) ..... 20&5%
Climax, Club, League, Rival 10 and 12 gauge ..... 25&5%
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12, 16 and 20 gauge 15%
Trap and Metal Lined, 10, 12, 16 and 20 gauge ..... 33⅓&10&5%

Shells, Loaded—

Loaded with Black Powder ..... 40&5%
Loaded with Nitro Powder ..... 40&10&10&5%

Shoes, Horse, Mule, &c.—

F. o. b., Pittsburg.

Iron ..... per keg $3.50
Steel ..... per keg 3.25
Burden's, all sizes, ₩ keg $3.60

Shot—

Drop, up to B, 25-lb. bag.... $1.25@1.35
Drop, B and larger, per 25-lb. bag.. $1.50@1.60
Buck, 25-lb. bag ..... $1.50@1.60
Chilled, 25 lb. bag ..... $1.50@1.55
Dust Shot, 25-lb. bag ..... $1.50@1.11
Tatham's Chilled $1.55

NOTE.—*There is some irregularity in price and jobbers often undersell the manufacturers.*

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle:

	A1, 1st Grade.	*B2,* 2d Grade
Plain Back	$10 50	$9 60
Strap Back	9.90	9.00
Cleveland Pat'n	10.80	9.80

	C3, 3d Grade.	*D4,* 4th Grade
Plain Back	$8.70	$8.10
Strap Back	8.10	7.50
Cleveland Pat'n	8.40	7.80

All other sizes add 30c doz.
Black deduct 30c dos.

Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers $0.50@1.00, and Common, Plain Back Shovels are generally sold by jobbers at $6.75.

Sieves and Sifters—

Hunter's Imitation...gro. $9.50@10.00
Buffalo Metallic Blued, S. S. & Co., ₩ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

Eclipse.....₩ gr. $10.00
Electric Light.....₩ gr. $12.00
Hunter's Genuine.....₩ gr. $12.50
Shaker (Barler's Pat.) Flour Sifters, ₩ doz., $2.00.....40%

Sieves, Tin Rim—

Per dozen

Mesh	14	16	18	20
Black, full size	$0 95	.95	1.00	1.10
Plated, full size	$1.05	1.05	1.10	1.20
Black, scant		$0.75	.80	.85

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

Mesh 18, Nested, doz.....$0.65@0.75
Mesh 20, Nested, doz.....75@ .85
Mesh 24, Nested, doz..... .90@1.00

Sinks—

Cast Iron—

Standard list.....65@65&10%

NOTE.—*There is not entire uniformity in lists used by jobbers.*

Wrought Steel—

Columbus Galv'd and Enameled..60&5%
Columbus, Painted.....45%
L. & G. Mfg. Co., Galvanized.....50%
L. & G. Mfg Co., Enameled.....50%

Skeins, Wagon—

Cast Iron.....70&10@75%
Malleable Iron.....40&10@50%
Steel.....40@40&10%

Slates—

"D" Slates.....40@40&10%
Unexcelled Noiseless Slates.....
60&10&10&10@60&10&10&10&10%
Wire Bound.....35@40&5%
Double Slates, add $1 case, net.

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling $ 2.00.....83⅓%

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby.....35&2½
High Grade.....45&2½
Jockey.....40&2½
Trojan.....45&2½
Yankee.....35&2½
Yankee, Roller.....30&2½
Covert's Saddlery Works:
Banner.....60&10%
Crown.....60&10%
Model.....60&10%
Triumph.....60&10%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....40%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....65@65&10%
Solid Swive.....65&10@65&10&10%
Sargent's Patent Guarded.....
60⅔&10%

Snaths—

Scythe.....45&5&2½%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@50&10&5%
Cheap.....60@60&10%
International Silver Co.:
1847 Rogers Bros.....40&10%
Rogers & Bro., William Rogers Eagle Brand, and Rogers & Hamilton.50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60&10&10%
No. 77 Silver Plated Ware.....70&10%

Miscellaneous—

German Silver.....60&10@60&10&10%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list.....1 & 10%

Tinned Iron—

Teas.....*per gro.* 45@55c
Tables.....*per gro.* 90c@$1.00

Springs—

Door—

Gem (Coil).....80%
Star (Coil).....80%
Torrey's Rod, 59 in.....₩ doz. $1.10@1.25
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

Factory Shipments.

	1¼ *in and wider*	*Blk. Hf.*	*Brt.*	*Brt.*
	5½	6¾	9	9c lb

Cliff's Bolster Springs.....85%
Cliff's Seat Springs.....₩ pair 55¢

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $24.....50%

Squares—

Nickel plated.... } *List Jan. 5, 1900*
Steel and Iron... } .....70&10@75&5%
Rosewood Hdl Try Square and T-Bevels.....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels.
50&10@50&10&10%
Disston's Try Sq. and T-Bevels.....60&10%
Winterbottom's Try and Miter.....50&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap.....*doz.* $2.00@2.75
Good Grade.....*doz.* $2.50@3.50
Tinned Iron.....*doz.* $0.75@1.25
Iron, Porcelain Lined doz. $2.50@3.25
Jennings' Star.....₩ doz. $1.85@1.90
King.....₩ doz. $2.00

Staples—

Barbed Blind.....*lb.* 7@7¼c
Electricians', Association list.....
80&10&10&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting. Staples....*per lb.*..
3¼@3¼c
Grand Crossing Tack Co.'s list...80&10%

Steels, Butchers'—

Dick's.....40%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%

Steelyards.....25@35&10%

Stocks and Dies—

Blacksmiths'.....40@40&10%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25&30%
Curtis Reversible Ratchet Die Stock.25%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $10.80 per gro., 13 inch, $12.00
Cleveland Stone Co., list Nov., '99..33⅓%
Pike Mfg. Co. 1901 list:

Black Diamond S. S.	₩ gro.	$12.00
Lamoille S. S.	₩ gro.	$11.00
White Mountain S. S.	₩ gro.	$9.00
Green Mountain S. S.	₩ gro.	$6.00
Extra Indian Pond S. S.	₩ gro.	$7.50
No. 1 Indian Pond S. S.	₩ gro.	$7.00
No. 2 Indian Pond S. S.	₩ gro.	$4.50
Leader Red End S. S.	₩ gro	$4.50

Balance of 1901 list 33⅓%.

Oil Stones, &c.

Chicago Wheel & Mfg. Co.:
Corundum Oil, Double Grit.....50%
Corundum Axe Stones, Slips, etc.....55%
Pike Mfg. Co. 1901 list:

	₩ lb
Arkansas Stone, No. 1, 3 to 5 in.	$2.85
Arkansas Stone, No. 1, 5½ to 8 in.	$3.50
Arkansas Slips No. 1	$4.00
Lily White Washita 4 to 8 in.	.60¢
Rosy Red Washita, 4 to 8 in	.60¢
Washita Stone, Extra, 4 to 8 in.	.50¢
Washita Stone, No. 1, 4 to 8 in.	.40¢
Washita Stone, No. 2, 4 to 8 in.	.30¢
Lily White Slips	.90¢
Rosy Red Slips	.90¢
Washita Slips, Extra	.80¢
Washita Slips, No. 1	.70¢
India Oil Stones (entire list)	.25%
Hindostan No. 1, Regular	₩ lb 8¢
Hindostan No. 1 Small	₩ lb 10¢
Axe Stones (all kinds)	.40%
Turkey Oil Stones, ex. 5 tos in.	₩ lb 80¢
Queer Creek Stones, 4 to 8 in.	.30¢
Queer Creek Slips	.90¢
Sand Stone	.5¢
Belgian, German and Swaty Razor Hones	.40%
Natural Grit Carving Knife Hones, ₩ doz.	$3.00
Quick Edge Pocket Knife Hones, ₩ doz.	$2.00
Mounted Kitchen Sand Stone, ₩ doz.	$1.50

Fanite Mills:
Emery Oil, ₩ doz. $5.00.....50@60%

Stoners—

Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₩ doz., No. 1, $10.00; No. 2, $11.00, 40&20%

Stops, Window—

Ives' Patent.....25&5%
Wilcox, Steel, per doz., $2.00.....50%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Strainers Pump—

Diamond Joe Pump Strainers..per doz. 75¢

Straps, Box—

Cary's Universal case lots.....30&10%

Stretchers, Carpet—

Cast Iron, Steel Points...*doz.* 55@65c
Socket.....*doz.* $1.75

Strops, Razor—

Smith & Hemenway Co.....70%

Stuffers, Sausage—

Miles' Challenge, ₩ doz. $20...50&50&5%
Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Tacks Brads, &c.—

List Jan. 15, '92.

Carpet Tacks, American 90&10@....%
American Cut Tacks....90&10@....%
Swedes Iron Tacks.....90&10@....%
Swedes Upholsterers' Tacks.....
90&10@....%
Gimp Tacks.....90&10@....%
Lace Tacks.....90&10@....%
Trimmers' Tacks.....90&10@....%
Looking Glass Tacks.....70&10%
Bill Posters' and Railroad Tack....
90&10@....%
Hungarian Nails.....80&15%
Common and Patent Brads.....80&10%
Trunk and Clout Nails.....80&10%

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&2½% on Standard Weights.****

Miscellaneous—

Double Point Tacks.....90&5 *or* 7 *tens*
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10&5%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $2.20
Emerald, S. S. & Co.....60-gal., $4.00
Queen City S. S. & Co., 30-gal.....$3.35
Queen City S. S. & Co., 60-gal.....$4.25

Tapes, Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....15@20&5%
Steel.....40&10&5%
Chesterman's.....25@25&5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1890.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

Thermometers—

Tin Case.....30&10@30&10&5%

Ties, Bale—Steel.

Standard Wire.....50&10&5%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6¼ in. ₩ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₩ 1000..$11.00
Galv. Steel 5-32 x 11½ in. ₩ 1000..$12.00
Galv. Steel 5 32 x 15¼ in. ₩ 1000..$14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & I. J. White.....20@20&5%

Saw—

Atkins' new list.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Game—

Oneida Pattern.....75&5@75&10&5%
Newhouse.....45@50%
Hawley & Norton.....65&5&70%
Victor (Oneida Pattern).....75@75&10%
Star (Blake Pattern).....65&10@70&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes.....
8½@9c
Mouse, Round or Square Wire.....
doz. $0.85@1.00
American Pattern French Rat and Mouse Traps—
No. 1, Detroit Marty Pattern, ₩ doz. $4.50; in ¼ gro. lots, ₩ doz.....$4.00
No. 2, Detroit Marty Pattern, ₩ doz. $1.25; in ¼ gro. lots, ₩ doz.....$1.00
Detroit Marty Pattern Mouse, ₩ doz. $2.00; in ¼ gro. lots, ₩ doz.....$1.75
Diamond Joe Mouse Traps....per doz. 60¢
Diamond Joe Rat Traps....per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½, ₩ doz. $12.00
No. 3, Rat, ₩ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₩ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₩ doz. $3.50; case of 72 $2.75 doz.
No. 5, Mouse, ₩ doz. $2.75;..case of 72 $2.25
Schuyler's Rat Killer, No. 1, ₩ gr. $30.00; No. 2, ₩ gr. $30.00; Mouse, No. 3, $18.00.....50%

Fly—

Balloon, Globe or Acme.....
doz. $1.15@1.25; gro. $10.50@11.00
Harper, Champion or Paragon.....
doz. $1.35@1.50; gro. $12.00@13 50

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....40%
Never-Break Steel Garden Trowels.....
gro. $7.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Pl'st'ring.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Daisy Stove Trucks, Improved pattern ₩ doz. $21.00
Model Stove Trucks.....₩ doz. $13.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5 50*	*6.00*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz.	$5 25	6.00	6.75	6.50	7 25	8.00

Twine—

Binder—

Small lots f. o. b. New York, Philadelphia or Boston.
White Sisal, 600 ft. to lb., per lb. 8@8¼c
Standard, 600 ft. to lb., per lb. 8@8¼c
Manila, 600 ft. to lb.....per lb. 10@10¼c
Pure Manila, 650 ft. to lb. per lb. 11¼@11¾c
For carloads deduct ¼c per lb.

Miscellaneous—

Flax Twine—	*DO*	*B.*
No. 9, ¼ and ½-lb. Balls	*22c*	*21c*
No. 12, ¼ and ½-lb. balls	*18c*	*20c*
No. 18, ¼ and ½-lb. Balls	*18c*	*18c*
No. 24, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 36, ¼ and ½-lb. Balls	*15c*	*17c*

Chalk Line, Cotton, ½-lb. Balls.....
22@22½c
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....7@8c
Cotton Wrapping, 5 Balls to lb according to quality...10½c@17c
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@15c
American 3 Ply Hemp, 1-lb. Balls..
15@15c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8½c
India 2-Ply Hemp, 1-lb. Balls.....8½c
India 3-Ply Hemp, 1¼-lb. Balls.... 9c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls...
9¼@10c
Mason Line, Linen, ½-lb. Balls...15c
No. 9½ Mattress, ¼ and ½-lb. Balls 37c
Wool.....*c*

Vises—

Solid Box.....80%
Bonney's Saw Vises.....40&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40&10%
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Keystone.....70%
Lewis Tool Co.....30&30%
Massey's Perfect.....15&20%
Massey's:
Clincher.....30@40%
Combination, Quick Adj.....40%
Woodworker's.....15@20%
Merrill's.....20%
Miller's Falls.....low list 10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55&60%
Prentiss.....20@25%
Sargent's.....40%
Simpson's Adjustable.....40%
Snedliker's X. L.....20@25%
Stephens'.....20@25%
Van, W. & W. Hdw. Co.....40%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $18 .50&10%
Disston's D 8 Clamp and Guide, ₩ doz. $30.....25%
Reading.....40&10%
Wentworth's Rubber Jaw, Nos. 1 2 and 3.....30&10%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%

Parker's Combination Pipe:

87 Series	60%
187 Series	60&5%
No. 870	40%

Wads—Price Per M.

B. E., 11 up		60c
B. E., 9 and 10		70c
B. E., 8		80c
B. E., 7		80c
P. E., 11 up		*$1.00*
P. E., 9 and 10		*1.25*
P. E., 8		*1.50*
P. E., 7		*1.50*
Ely's B. E., 11 and larger		*$1.70@1.75*
Ely's P. E., 12 to 20		*$3.60@3.25*

Dis. 30&25%

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—
S. S. & Co. Reduced List.....40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground.....65%
Unground.....70%
White Enameled Ware:
Manlin Kettles.....75&10&5@80%
Covered Ware:
Tinned and Turned.....
40&10@40&10&5%
Enameled and Plain.50@50&10&5%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, list July '99..35%
Granite Ware, list Jan. 1, '94, revised Jan. 2, '95.....40&10%
Second Quality, Agate Nickel Steel..65%
Second Quality, Granite.....
70&10@70&10&10%
Iron Clad:
Peppered Ware, high list.....70%
Mottled Ware, high list.....75%
Never Break Enameled....50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.

Avery Spiders & Griddles.....65@65&5%
Avery Kettles.....60%
Purcelained.....50&5@50&10%
Never Break Spiders and Griddles.....
65@65&5%
Never Break Kettles.....60@60&10%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled.....50&5%

Washboards—

Solid Zinc: ₩ doz
Crescent, family size, bent frame..$3.00
Red Star, laundry size, stationary protector.....$4.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.85
Wilson, family size, bent frame...$2.75
Single Zinc Surface:
Naiad protector, family size, open back peforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25
Wilson, bent frame family size, ventilated back.....$1.95

Washers—

Leather, Axle—

Solid ..... 30@10@10&5%
Patent ..... 35&10@35&10@20%
Coil: ⅛ 1 1¼ 1¾ *Inch.*
11c 13c 12c 15c *per 100*

Iron or Steel—

Size bolt .... 5-16 ⅜ ½ ⅝ ¾
Washers $5.20 4.20 3.00 2.80 2.60
In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.

Cast Washers—

Over ¼ inch, barrel lots, per lb. ..... 1¼@1¾c

Washer Cutters—

See Cutters, Washer.

Washing Machines—

See *Machines, Washing.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Oil Finish ..... lb. 2.90@3.10c

Weights, Sash—

Per ton ..... $19.00@22.50
Some Foundries make price $1@$2 lower.

Well Buckets, Galvanized

See Pails, Galvanized.

Wheels Well—

2-in., $1.65@1.75; 10-in., $2.00@2.10; 12-in., $2.50@2.75; 14-in., $3.25@3.40

Wire and Wire Goods—

Brt. and Ann., 6 to 9 ..... 70&10@70&10&5%
Brt. and Ann., 10 to 18 ..... 72½&10@72½&10%
Brt. and Ann., 19 to 26 ..... 75&10@75&10%
Brt. and Ann., 27 to 36 ..... 75&10@75&10&5%
Cop'd and Galv., 6 to 9 ..... 70@70&5%
Cop'd and Galv., 10 to 18 ..... 70&5@70&10%
Cop'd and Galv., 19 to 26 ..... 75@75&5%
Cop'd and Galv., 27 to 36 ..... 75&5@75&10%
Tinned, 6 to 14 ..... 75@75&5%
Tinned, 15 to 18 ..... 70&5@70&10%
Tinned, 19 to 26 ..... 70@70&5%
Tinned, 27 to 36 ..... 65&10@70%
Annealed Wire on Spools ..... 70&5@70 &10%
Brass and Copper Wire on Spools ..... 60&5@50&10%
Brass, list Feb. 26, '98 ..... 35%
Copper, list Feb. 26, '98 ..... 15%
Cast Steel Wire 50%
Tube Steel Wire ..... $5.00 to $., 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—

List April 1, 1901 ..... 35@35&10%

Wire Cloth and Netting—

Galvanized Wire Netting ..... 35@35&5%
Painted Screen Cloth per 100 ft ..... $1.00@1.10
Light Hardware Grade:
2-8 Mesh, Plain (3c. list) sq. ft. 1½c
2-8 Mesh, Galv. (3c. list) sq. ft. 2½c

Wire Barb—See *Trade Report.*

Wire, Rope—See *Rope, Wire.*

Wrenches—

Agricultural ..... 70&10@75&5%
Case lots ..... 75&10%
Acme ..... 60&10%
Baxter's S ..... 60&10%
Bull Dog 70%
Coes' Genuine ..... 40&10&5&5%
Coes' "Mechanics" ..... 40&10&10&5&5%
Alligator ..... 60&10&10%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Cylinder or Gas Pipe 50%
Extra Heavy 45%
Merrick's Pattern 50%
No. 8 Pipe, Bright 55%
Bindley Automatic 30%
Boardman's ..... $3½&5
Donohue's Engineer ..... 40&10%
Eagle ..... 50&10%
Gem Pocket 30%
Hercules 70%
Knife Handle, Machinists' (W. & B.):
Case lots ..... 50&10%
Less than case lots ..... 60&5%
Improved Pipe (W. & B.) 40%
Solid Handles, P. S. & W ..... 50&10%
Stevenson ..... 60&10&10%

Wrought Goods—

Staples, Hooks, &c., list March 17 '98 ..... 35&10@35&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed ..... 60&3%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers & Freighters' ..... list net

Zinc—

Sheet ..... lb 6½c@7c

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.

Lead, Foreign white, in Oil ..... 7¾@ 9¾
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¼
Lots less than 500 ℔ ..... @ 7
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ½
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price ..... @ 1¼
Lead, White, Dry in bbls ..... 6¼@ 6
Lead, American, Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry ..... ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry ..... @ 9½
Zinc, Antwerp Red Seal, dry ..... @ 6½
Zinc, Antwerp, Green Seal, dry ..... @ 7½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12½
Lots of less than 1 ton ..... 12½@12¾
Zinc, V. M. French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11½
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.

Black, Carbon ..... ℔ 8 @20
Black, Drop, Amer ..... 4 @ 7
Black, Drop, Eng ..... 7 @11
Black, Ivory ..... 12 @21
Lamp, Com ..... 4½@ 6
Blue, Celestial ..... ℔ 4 @ 6
Blue, Chinese ..... 30 @35
Blue, Prussian ..... 28 @34
Blue, Ultramarine ..... 4 @20
Brown, Spanish ..... 1@ 1
Brown, Vandyke, Amer ..... 1½@ 2½
Brown, Vandyke, Foreign ..... 2½@ 3½
Carmine, No. 40 ..... ℔ $2.05@2.75
Green, Chrome, ordinary ..... 5 @ 6½
Green, Chrome, pure ..... 16 @20
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6
Lots less than 500 ℔ ..... @ 6½
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6
Lots less than 500 ℔ ..... @ 6½
Oxher, French Washed ..... $1.35@2.50
Oxher, Dutch Washed ..... 4½@ 5
Oxher, American ..... ℔ ton $10.00@15.00
Orange Mineral, English ..... ℔ ℔ 8½@11½
Orange Mineral, French ..... 11 3-16@11½
Orange Mineral, German ..... 8½@ 9½
Orange Mineral, American ..... 8 @ 8½
Red, Indian, English ..... 4½@ 8½
Red, Indian, American ..... 3 @ 3½
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer ..... ℔ 100 ℔ 80@1.75
Red Venetian, English ..... ℔ ℔ 1.80@3.00
Sienna, Italian, Burnt and Powdered ..... ℔ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd ..... 3½@ 7½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ℔ ℔ 1½@ 2
Talc, French ..... ℔ 100 ℔ $1.25@1.50
Talc, American ..... 90 @1.10
Terra Alba, French, ℔ 100 ℔ .95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 ..... 65 @85
Terra Alba, American No. 2 ..... 45 @50
Umber, Turkey, Bnt. & Pow. ℔ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 10½@25
Vermilion, American Lead ..... 10 @40
Vermilion, Quicksilver, bulk ..... @72
Vermilion, Quicksilver, bags ..... @73
Vermilion, English, Import ..... 80 @95
Vermilion, Chinese ..... .$1.00@1.20

Colors in Oil.

Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @40
Blue, Prussian ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 9½@12
Green, Chrome ..... 10 @12
Green, Paris ..... @24
Sienna, Raw ..... 10 @13
Sienna, Burnt ..... 10 @15
Umber, Raw ..... 9½@12
Umber, Burnt ..... 9½@12

Miscellaneous.

Barytes, Foreign, ℔ ton ..... $19.00@21.00
Barytes, Amer. floated ..... 19.00@20.00
Barytes, Crude ..... 9.00@10.00
Chalk, in bulk ..... ℔ ton 2.50@ 3.00
Chalk, in bbls ..... ℔ 100 ℔ ..@ 35
China Clay, English ..... ℔ ton 12.00@17.50
Cobalt, Oxide ..... ℔ 100 ℔ 2.25@ 2.50
Whiting, Common ..... ℔ 100 ℔ .40@ .60
Whiting, Gilders ..... .45@ .65
Whiting, extra Gilders' ..... .55@ .68

Putty.

In bulk $1.80
In bladders 2.25
In cans, 12 ℔ to 25 ℔ 2.25
In cans, 1 ℔ to 5 ℔ 2.25

Spirits Turpentine.

In Southern bbls ..... 34½@34¾c
In machine bbls ..... 34¾@35½c

Glue.

Low Grade ..... ℔ ℔ 9 @13
Cabinet ..... 11½@16
Medium White ..... 14½@16½
Extra White ..... 18 @23
French ..... 12 @40
Irish ..... 13½@16

Animal, Fish and Vegetable Oils.

Linseed, City, raw ..... ℔ gal. 61@63
Linseed, City, boiled ..... 63 @64
Linseed, State and West'n, raw ..... 59 @60
Linseed, raw Calcutta seed ..... @85
Lard, Prime ..... 66 @67
Lard, Extra No. 1 ..... 50 @58
Lard, No. 1 ..... 43 @44
Cotton-seed, Crude ..... 31 @32
Cotton-seed, Summer Yellow, prime ..... 34 @35
Cotton-seed Summer Yellow, off grades ..... 33 @33½
Sperm, Crude ..... @ --
Sperm, Natural Spring ..... @ --
Sperm, Bleached Spring ..... @ --
Sperm, Natural Winter ..... 61 @63
Sperm, Bleached Winter ..... 64 @66
Whale, Crude ..... @ --
Whale, Natural Winter ..... @45
Whale, Bleached Winter ..... @47
Menhaden, Crude, Sound ..... 28 @29
Menhaden, Light Strained ..... 32 @33
Menhaden, Bleached Winter ..... 35 @ --
Menhaden, Ex Bleached Winter ..... 37 @38
Tallow, prime ..... 52 @53
Cocoanut, Ceylon ..... 5½@ 5¾
Cocoanut, Cochin ..... 6¼@ 6½
Cod, Domestic ..... 33 @34
Cod, Newfoundland ..... 35 @37
Red Elaine ..... 34 @35
Red Saponified ..... ℔ ℔ 4½@ 4¾
Olive, Italian, bbls ..... 62 @67½
Neatsfoot, prime ..... 52 @ 54
Palm, prime, Lagos ..... ℔ ℔ 5½@5¾

Mineral Oils.

Black, 30 gravity, 25@30 cold test ..... ℔ gal. 9½@10½
Black, 29 gravity, 15 cold test ..... 10½@11½
Black, summer ..... 9½@ 9½
Cylinder, light filtered ..... 14½@17½
Cylinder, dark filtered ..... 11½@16½
Paraffine, 903-907 gravity ..... 13½@19½
Paraffine, 903 gravity ..... 11½@11½
Paraffine, 883 gravity ..... 9½@10½
Paraffine, red, No. 1 ..... 12½@15½
In small lots ½¢ advance.

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to these branches of industry.

RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

UNITED STATES AND BRITISH AMERICA.

Regular Edition, Issued every THURSDAY morning, - - - - - - - - - - $5.00 a year
Two Dollar Edition, large number FIRST and THIRD THURSDAYS of every month, Bulletin number each intervening Thursday, 2.00 "
Dollar Edition, large number FIRST THURSDAY of every month, Bulletin number each intervening Thursday, - - 1.00 "

RATES OF ADVERTISING: ONE INCH.

ONE INSERTION, - - - - - - - - $3.00
ONE MONTH, (5 times - - - - - - - 11.25
THREE MONTHS, - - - - - - - - 26.25
SIX MONTHS, - - - - - - - - $45.00
ONE YEAR, - - - - - - - - - 75.00
Rates for larger spaces quoted on application.

New York (Main Office), - - 232-238 William Street, - - - - - - - - DAVID WILLIAMS CO., Pub'rs.
Philadelphia, - - - - - - Forrest Building, 117 119 South Fourth Street, - - - THOMAS HOBSON, Manager.
Pittsburgh, - - - - - - - Hamilton Building, 335-337 Fifth Avenue, - - ROBERT A. WALKER, Manager.
Chicago, - - - - - - - - Fisher Building, Dearborn and Van Buren Streets, - { H. H. ROBERTS, Business Manager. GEO. W. COPE, Resident Asso. Ed.
Cincinnati, - - - - - - - Pickering Building, 5th and Main Streets, - - - - HENRY SMITH, Manager.
St. Louis, - - - - - - - - Chemical Building, 721 Olive Street, - - - -
Boston, - - - - - - - - Mason Building, 70 Kilby Street, - - - - - - WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - - - The Cuyahoga, 311 Superior Street, - - - - - EZRA S. ADAMS, Manager.

LONDON OFFICE: Hastings House, Norfolk Street, Strand.
AUSTRALIAN OFFICES: Melbourne, Hardware Chambers, 231 Elizabeth Street; Sydney, Palings Building.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.
Newsdealers or Booksellers in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.: The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

CURRENT METAL PRICES.

MAY 15, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty Round, 0.6¢ ₱ ℔; Square, 0.8¢ ₱ ℔
1 to 1¾ in. round and square ..... } ₱ ℔ 1.75@1.85¢
1⅛ to 4 in. x ¾ to 1 in..... }
Refined Iron:
1 to 1¾ in. round and square..... } ₱ ℔ 1.80@1.90¢
1¼ to 4 in. x ¾ to 1 in..... }
1¼ to 4 in. x ¼ to 5-16..... ₱ ℔ 1.95@2.00¢
Rods—⅜ and 11-16 round and square. ₱ ℔ 2.15@2.25¢
Angles: Ctn ₱ ℔
3 in. x ¼ in. and larger..... 2.10¢
3 to 3½ in. x 3-16 in..... 2.10¢
1¼ to 3 in. x ¼ in..... 2.20¢
1¼ to 2¼ in. x 3-16 in and thicker..... 2.10¢
1 to 1¾ in. x 3-16 in..... 2.20¢
1 to 1¾ x ⅛ in..... 2.30¢
⅞ x ¼ in..... 2.40¢
⅝ x ¼ in..... 2.50¢
⅝ x ⅛ in..... 3.50¢
⅜ x 3-32 in..... 4.00¢
Tees:
1 in..... 2.60¢
1¼ in..... 2.40¢
1¼ in. and larger..... 2.90¢
Beams..... 2.25¢
Channels, 3 in. and larger..... 2.25¢
Bands—1¼ to 6 x 3-16 to No. 8..... ₱ ℔ 2.20¢
"Burden's Best" Iron, base price..... ₱ ℔ 3.15¢
Burden's "H. B & S. Iron, base price..... ₱ ℔ 2.95¢
"Ulster"..... ₱ ℔ 3.60¢
Norway Bars..... 4 @4½¢
Norway Shapes..... 4½@4¾¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery.....	1.90 to 1.95¢
Toe Calk, Tire and Sleigh Shoe.....	2.00@2.50¢
Best Cast Steel, base price in small lots.....	7¼¢
Best Cast Steel Machinery, base price in small lots.....	6 ¢

Soft Steel Sheets—

¼ inch.....	2.20¢	No. 14.....	2.70¢
3-16 inch.....	2.30¢	No 16.....	2.90¢
No. 8.....	2.30¢	No. 18.....	3.10¢
No. 10.....	2.50¢	No. 20.....	3.40¢
No. 12.....	2.60¢	No. 22.....	3.50¢

Sheet Iron from Store.

Black.

	One Pass, C. R Soft Steel.	R. G. Cleaned.
Nos. 14 to 16.....	₱ ℔, 3.30.....	3.35¢
Nos. 18 to 21.....	₱ ℔, 3.40.....	3.45¢
Nos. 22 to 24.....	₱ ℔, 3.50.....	3.55¢
Nos. 25 and 26.....	₱ ℔, 3.60.....	3.65¢
No. 27.....	₱ ℔, 3.70.....	3.75¢
No. 28.....	₱ ℔, 3.80.....	3.85¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₱ ℔ 10½¢
Patent Planished..... ₱ ℔ A, 9¾¢; B, 8¾¢, net

Galvanized.

	B. B.
Nos. 10 to 16.....	₱ ℔, 12¢
Nos. 17 to 21.....	₱ ℔, 13¢
Nos. 22 to 24.....	₱ ℔, 14¢
Nos. 25 to 26.....	₱ ℔, 15¢
No. 27.....	₱ ℔, 16¢
No. 28.....	₱ ℔, 17¢
No. 29.....	₱ ℔, 19¢
No. 30.....	₱ ℔, 21¢

60 & 10 off; 67½ & 10 off

36 in. 1¢ ₱ ℔ higher.

Foreign Steel from Store—

Best Cast.....	₱ ℔ 15 ¢
Extra Cast.....	₱ ℔ 18 @ 20 ¢
Swaged, Cast.....	₱ ℔ 16 ¢
Best Double Shear.....	₱ ℔ 15 ¢
Blister, 1st quality.....	₱ ℔ 13 ¢
German Steel, Best.....	₱ ℔ 10 ¢
2d quality.....	₱ ℔ 9 ¢
3d quality.....	₱ ℔ 8 ¢
Sheet Cast Steel, 1st quality.....	₱ ℔ 15 ¢
2d quality.....	₱ ℔ 14 ¢
3d quality.....	₱ ℔ 12 ¢
R. Mushet's "Special"	₱ ℔ 46 ¢
" " Annealed.....	₱ ℔ 75 ¢
" " "Titanic".....	₱ ℔ 10 ¢
Hobson's Choice XX Extra Best.....	₱ ℔ 35 ¢
Jessop Self Hardening.....	₱ ℔ 45 ¢
Seamans' "Nelson" Steel.....	40 ¢
Hobson's "Soho" Special Self-Hardening..	₱ ℔ 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.

	Per ℔
Banca, Pigs.....	27¼@27¾¢
Straits, Pigs.....	27¼@27¾¢
Straits in Bars.....	28¼@28¾¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20..... $6.75
IX, 14 x 20..... 8 25
Melyn Grade:
IC, 14 x 20..... 6.25
IX, 14 x 20..... 7.75
Allaway Grade:
IC, 14 x 20..... 5.50
IX, 14 x 20..... 6.50

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 108 ℔ ..... $4.85@4.90
IX, 14 x 20..... $5.95@6.00
IXX 14 x 20..... $7.20@7.25

American Terne Plates—

IC, 20 x 28..... $9.50
IX, 20 x 28..... 11.25

Tin Boiler Plates, American—

IXX, 14 x 20..... 112 sheets..... $12.50
IXX, 14 x 28..... 112 sheets..... 13.50
IXX, 14 x 31..... 112 sheets..... 15.00

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₱ lb.

Ingot—

Lake ..... 17¼@17¾¢
Ansonia grade Casting..... 16¾@17¼¢

Sheet and Bolt—

January 19, 1900. Net.

Prices, in cents per pound.
Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz., 25 to 50 lb.	24 oz. to 32 oz., 18¾ to 25 lb.	16 oz. to 24 oz., 12½ to 18¾ lb.	14 oz. and 15 oz., 11 to 12½ lb.	12 oz. and 13 oz., 9½ to 11 lb.	10 oz. and 11 oz., 7½ to 9½ lb.	8 oz. and 9 oz., 6¼ to 7½ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	21	21	21	21	22	23	24	27	30
30	96	72	21	21	21	21	22	24	27	30	
30	.....	96	21	21	21	21	23	27			
36	72	.....	21	21	21	21	23	25		32	
36	96	72	21	21	21	23	23	27	30		
36	120	96	21	21	21	23	24				
36	.....	120	22	21	22	23					
48	72	.....	21	21	21	23	25	26	31		
48	96	72	21	21	22	24	26	29			
48	120	96	21	21	23	25	29				
48	.....	120	21	22	24	27					
60	72	.....	21	22	22	24	27	32			
60	96	72	21	21	23	25	30				
60	120	96	21	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	21	22	24	29					
72	144	96	21	23	26	31					
72	.....	144	22	24	29						
108	120	.....	22	24	30						
108	.....	120	24	25							
wider than 108	144	.....	25	27							
	.....	144	26	29							

Rolled Round Copper, ⅜ inch diameter and over, ₱ ℔ 2¢.
Circles, Segments and Pattern Sheets, 3¢ ₱ ℔ advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₱ square foot and heavier, 1¢ ₱ ℔ over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₱ square foot, 2¢ ₱ ℔ over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₱ ℔ advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₱ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₱ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₱ ℔	25¢
12 oz. and up to 14 oz. to square foot, ₱ ℔	23¢
10 oz. and up to 12 oz., ₱ ℔	2 ¢
Lighter than 10 oz., ₱ ℔	31¢

Circles less than 8 in. diameter, 2¢ ₱ ℔ additional.
Circles over 13 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
Last March 2, 1900.

Nos.	0000 to 8 Base	9 and 10	11 and 12
		⅛¢	¼¢ ₱ ℔ adv.
Nos.	13	14 15	16
	⅛¢	¼¢	½¢ ₱ ℔ adv.
Nos.	17	18 19	20
	½¢	2¢	2½¢ ₱ ℔ adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	...	.....	...	.....	33	31	30	30	28	27	25	24
12	10	...	.....	37	35	33	31	30	29	28	27	25	24
13	11	...	.....	37	35	33	31	30	29	28	27	25	24
14	12	...	41	37	35	33	31	30	29	28	27	25	24
15	13	...	42	38	36	33	32	31	30	30	28	26	25
16	14	...	43	39	37	34	33	32	31	30	29	26	25
17	15	...	44	40	38	35	34	33	32	31	30	27	26
18	16	46	46	42	39	36	35	34	33	32	30	28	27
19	17	47	47	43	40	37	36	35	34	33	32	29	28
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	43	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	45	44	43	42	40	41
25	24	86	71	56	51	49	47	46	45	45	43	43	44

Copper Bronze and Gilding Tube, 3¢ ₱ ℔ additional.

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
28	22	22	27	21	21	21	21	21	21	21	25	23	25	27	28¢ ₱ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₱ ℔ additional

Brazed Brass Tubing.

(*To No.* 19, *inclusive.*) Feb. 26 1896
Brown & Sharpe's gauge standard.

	Per ℔.
Plain Round Tube, ⅛ in. up to 2 in.....	$0.35
" " ¼ " ¾ "	.36
" " ¼ " 1 "	.38
" " ¼ " 1¼ "	.41
" " 5-16 " 1½ "	.48
" " ⅜ " 1¾ "	.65
" " ⅜ " 2 "	1.00
" " ½ " 2 "	1.50
Smaller than ⅛ inch.....	Special
3 inch and larger.....	.40
Over 3 inch to 3½ inch, inclusive.....	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list %..... 35%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39

Common High Brass. Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in. 40
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24.	40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add ½¢ ₱ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 20%

Wire in Coils.

List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gil l'g bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28¾
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.30	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 20%; Copper Wire, Net.
List November 16, 96.
Spring Wire, 2¢ ₱ ℔ advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₱ ℔, net..... 20¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₱ ℔ net. 21¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₱ ℔
Western Spelter..... 4.45@4½¢

Zinc.

Duty: Sheet, 2¢ ₱ ℔.
600 ℔ casks..... 6¾¢ | Per ℔..... 7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₱ ℔. Pipe and Sheets, 2½¢ ₱ ℔.
American Pig..... 4.60@4.62½¢
Bar..... 5¼@5½¢
Pipe..... 5¢
Tin Lined Pipe..... 12½¢..... 20% off
Block Tin Pipe..... 40 ¢..... 20% off
Sheet Lead, full rolls..... 7¢..... 20% off
Sheet Lead, cut..... 7¼¢..... 20% off
Old Lead in exchange, 4½¢ ₱ ℔.

Solder.

½ & ¼ guaranteed..... 18 @18½¢
No. 1..... 14½@14¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₱ lb.

Cookson.....	₱ ℔ 10¾@11¢
Hallett's.....	₱ ℔ 9¼@9½¢
U. S.....	₱ ℔ 9¼@9½¢

Aluminum—

Duty: Crude, 8¢ ₱ ℔. Plates, Sheets, Bars and Rods, 13¢ ₱ ℔.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots..... ₱ ℔ 37¢
100-℔ lots..... ₱ ℔ 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots..... ₱ ℔ 34¢
100-℔ lots..... ₱ ℔ 33¢

Aluminum Sheet, B. & S. gauge. 50 ℔ or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₱ ℔.	₱ ℔.	₱ ℔
Nos. 13 to 19.....	$0.43	$0.44	$0.47
No. 20.....	.44	.46	.49
Nos. 21 to 23.....	.46	.48	.51
No. 24.....	.46	.50	.53
No. 25.....	.47	.51	.54
No. 26.....	.47	.54	.59
No. 27.....	.48	.57	.62
No. 28.....	.48	.57	.64
No. 29.....	.49	.60	.69
No. 30.....	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₱ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₱ ℔ 40¢	No. 15	₱ ℔ 43¢
No. 9 to No. 10	₱ ℔ 40½¢	No. 17	₱ ℔ 50¢
No. 11	₱ ℔ 41 ¢	No. 18	₱ ℔ 55¢
No 12	₱ ℔ 41½¢	No. 19	₱ ℔ 60¢
No. 13	₱ ℔ 42 ¢	No. 20	₱ ℔ 65¢
No 14	₱ ℔ 43½¢	No. 21	₱ ℔ 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper.....	₱ ℔ 15 ¢
Light and Tinned Copper.....	₱ ℔ 13½¢
Heavy Brass.....	₱ ℔ 10 ¢
Light Brass.....	₱ ℔ 8½¢
Lead.....	₱ ℔ 4½¢
Tea Lead.....	₱ ℔ 3½¢
Zinc.....	₱ ℔ 2½¢
No. 1 Pewter.....	₱ ℔ 19 ¢
No. 2 Pewter.....	₱ ℔ 9½¢
Tin Plate Scrap.....	₱ ton $8.50
Wrought Scrap Iron.....	₱ gross ton $11.00@11.50
Heavy Cast Scrap.....	₱ gross ton $10.50@11.00
Stove Plate Scrap.....	₱ gross ton $7.50@8.00
Burnt Iron.....	₱ gross ton $5.50@6.00